# AGRICULTURAL CHEMICALS



In This leave:

Bunkers Like Fortilizer Loans (Guest Bultorial) . Chemical Control of Nemerodus . Control Officials Most

New Process in 2,4,5-T Higr. \* Fertilizer Safety Section Mosts .\* Procedures for Testing Insecticides

National Fartilizer Assa. Mosts . N. Cantral Wood Conference to Canada . Official Locks at Sall Conditioner

# Look to Powell for your next year's requirements



You can do something now to put yourself in the best competitive position next year. You can have these triple benefits offered by the one leading manufacturer who does not compete with you:

- \* QUALITY—Laboratory-controlled new production concentrates for full insecticidal effectiveness and trouble-free formulation.
- \* SERVICE—Strategically-located plants for speedy delivery.

  Technical service to help solve your formulation problems.
- \* PRICE—We do not compete with you; our prices are calculated to make you competitive.

Contract with us now. Assure yourself of full cooperation by your supplier . . . the kind of cooperation that puts you in the best competitive position.

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# These plants and Attaclay, joined forces to make dry dusts from sticky, solid chemicals



LOCATION: Gulf Coast

PRODUCT: 50% DDT dust base

EQUIPMENT: roller mill

PRODUCTION MANAGER: Our roller mill 'told' us Attaclay was the least costly material to use. With Attaclay we make 40% more of a tup-grade concentrate.



LOCATION: Pacific Northwest

PRODUCT: 50% DDT dust base

EQUIPMENT: air mill

OWNER: We've learned through experience that Attaclay gives us a superior product with excellent uniformity.



LOCATION: West Coast

PRODUCT: BHC dust base and wettable powder

EQUIPMENT: fluid energy mill

PLANT MANAGER: Our previous experience with other carriers was not good. Mills "gummed up" quickly... too many shutdowns. Attaclay lengthened our grinding cycle time to a point where production was upped 50%.



LOCATION: Mississippi

PRODUCT: 9-15 BHC-DDT cotton dust base

EQUIPMENT: steam-jacketed ribbon mixer

PLANT SUPERINTENDENT: Our 9-15 bases made with Attaclay didn't "set up" on standing. I can't say the same for any other carrier we tried.



The season-after-season vote of confidence on the part of Attaclay users all over the world tells its own forceful, conclusive story. Write us for a generous sample and detailed data... count on us for any help you need.

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HERE'S HELP FOR YOU—a new 12-page booklet entitled "Road Map To Quicker, Easier and Better Pesticide Formulations Through Attaclay." Your free copy for the writing.

### AGRICULTURAL CHEMICALS



A Monthly Magazine For the Trade

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### THIS MONTH'S COVER

Past presidents of the American Association of Fertilizer Control Officials were awarded plaques at the group's recent annual meeting in Washington, in honor of their service to fertilizer progress. Here is retiring president Dr. J. F. Fudge, left. inspecting his plaque with P. A. Yeats. Oklahoma City. Okla. newly-elected president of the Association. (Photo by Louis H. Wilson. American Plant Food Council)

VOL. 7 No. 11 NOVEMBER 1952

### In This Issue:

Meeting Calendar	. 21
Editorials	. 33
Guest Editorial  by Warren Garat	. 34
Fertilizer Officials Move Ahead	. 35
Soil Conditioners Scrutinized  by Allen B, Lemmon	. 37
Chemical Control of Nematodes	. 39
National Fertilizer Assn. to Florida	. 42
Procedures for Testing Insecticides	. 44
New Method of Manufacturing 2,4,5-T	. 46
Control Officials Meet in Washington	47
Fertilizer Safety Meeting Held	. 52
N. Central Weed Control Conference to Canada	. 55
Suppliers Bulletins	57
Technical Briefs	59
Listening Post	61
Industry News	79
Classified Advertising	124
Advertisers' Index	125
Tale Ends	126

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Entered as second-class matter November 4, 1949, at the Post Office at Baltimore, Md., under the Act of March 3, 1879.



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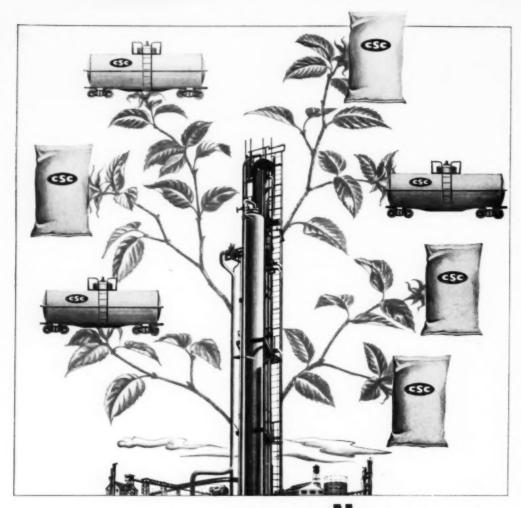
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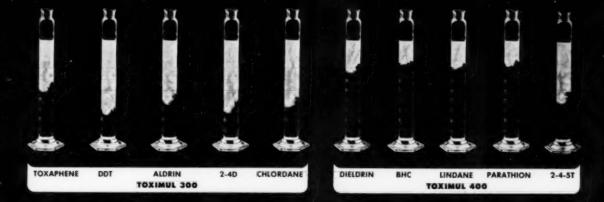
Anhydrous and Solutions are now being supplied the trade in quantity. Ammonium Nitrate will be produced by the new, exclusive Stengel process developed by CSC Research. This new method will enable us to supply the

product sized to your specification. CSC's Ammonium Nitrate will be marketed the last half of 1953.

For further information write Nitrogen Department, Agricultural Chemicals Division, Commercial Solvents Corporation, 260 Madison Avenue, New York 16, N. Y.



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Here at last—just in time for the 1953 season—are two anionic emulsifiers which, between them, take care of practically the whole range of polychlor insecticides.

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Monopotassium Phosphate (Crystals)	-0-	51.6%	34.2%	
Diammonium Phosphate (Crystals)	21.0%	53.85%	-0-	
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# **HUDSON ENLARGES GUARANTEE** ON MULTIWALL SACKS: NOW **COVERS DAMAGE ON PACKER**

### Will replace without cost any Hudson Multiwall Sack broken on packing or closing machines

NEW YORK CITY. The Hudson Pulp & Paper Corp. has announced the terms of an unusual new guarantee to purchasers of Multiwall Sacks. In the first such guarantee in Multiwall Sack history, the company binds itself to replace any Hudson Multiwall Sack which bursts, tears, splits, or otherwise fails in the course of packing or closing. Hudson emphasizes that this new guarantee is in addition to their usual warranties of quality and workmanship implicit in every contract.



A typical scene showing Multiwall Sacks being filled and closed. Now, for the first time, a Multiwall Sack manufacturer is guaranteeing to replace any sacks broken during such operation

### **Multiwall Sack Users** urged to investigate this offer

The new Hudson guarantee plan went into effect with all sacks purchased on or after Sept. 15, 1952. Multiwall Sack buyers who have learned of this new plan have hailed it as one of the most important developments in years.

Full information regarding the scope and benefits of the guarantee is being sent, without obligation, to all Multiwall Sack buyers who request it.

### Integrated Hudson mill assures delivery

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T. H. Mittendorf (right), Hudson Vice President in Charge of Sales, and J. B. Mendelsohn, Multiwall Sack Sales Manager, look over the first printed copy of the comp guarantee on Multiwall Sacks.

### World's most fully guaranteed Multiwall Sack

Hudson has such faith in the quality of its Multiwall Sacks that it gives the world's fullest guarantee on their performance. While other companies warrant their sacks only against abnormal breakage, Hudson guarantees that all its sacks must successfully pass all filling and closing operations, or be replaced without further cost.

### **Urge Multiwall Sack users** to write for facts

The Hudson Pulp & Paper Corp. invites all users of Multiwall Sacks to learn how they can using guarant



Hudson's Palatka mill is new, Hudson 42 years of paper making experience.



Dept. 141, 505 Park Ave., New York 22, N.Y.

# H Resists Caking! 33% NITROGEN... Phillips 66 Ammonium Nitrate is prilled ... small, coated pellets flow freely, resist caking, handle easily.

Nitrogen is in great demand. Even Phillips tremendous capacity isn't equal to today's requirements. But we're making four different kinds of high-quality nitrogen material for mixers and farmers.

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4. AMMONIUM NITRATE (see photograph and description above).

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Technical ground and flake Solutions Emulsifiable concentrates Wettable powders Dust concentrates

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Dust concentrates

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Butyl ester
Isopropyl ester
Tetrahydrofurfuryl ester (low volatile)
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. 2.4,5-T Weed Killers

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TRITON Emulsifiers are also manufactured and offered by Rohm & Haas in a wide selection for the economical and effective emulsification of the many organic pesticides in use today.

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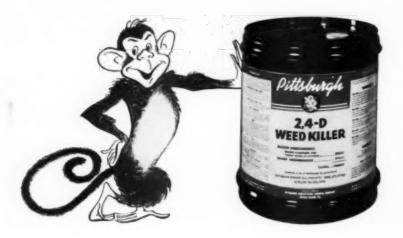
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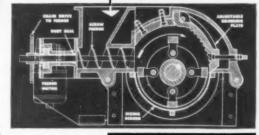
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NOVEMBER, 1952

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REPRESENTATIVES IN PRINCIPAL CITIES

### MEETING CALENDAR

National Fertilizer Association Fall Meeting, Roney Plaza Hotel, Miami, Fla., November 19-21.

Eastern Branch, A.A.E.E., Lord Baltimore Hotel, Baltimore, Md., November 24 & 25.

New Jersey Horticultural Society. Hotel Claridge. Atlantic City N. J. December 1-3.

Agricultural Ammonia Institute Convention. Hotel Baker, Dallas. Texas, December 3-5

Joint meeting, North Central Weed

Control Conference and Western Canadian Weed Conference, Royal Alexandra Hotel, Winnipeg, Canada, Dec. 9-10, 1952.

Chio Pesticide Institute. Deshler-Wallick Hotel, Columbus, Ohio. December 9 & 10.

Cotton Insect Control Conference Sixth Annual, Peabody Hotel, Memphia, Tenn., December 10

American Association of Economic Entomologists. Hotel Bellevue

Stratford, Phila., Pa., Dec. 15-18. Association of Southern Agricultural Workers. Roosevelt Hotel. New Orleans, La., February 9-11.

Southwestern Branch. A.A.E.E., Galvez Hotel. Galveston. Texas. February 26-27.

North Central States Branch. A.A.-E.E., Statler Hotel, St. Louis, Mo., March 19 and 20.

National Agricultural Chemicals Assn., Jung Hotel, New Orleans, La., April 11-13.

# **Two Generations** of Experience

### Anhydrous Ammonia

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ARCADIAN\*. the American Nitrate of Soda

> A-N-L\* Nitrogen Fertilizer

> > **Urea Products**

Sulphate of Ammonia

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Nitrogen Division products are the result of more than 60 years of experience. They are backed by an enviable reputation for high standards of product quality, enterprising research and reliable, dependable service.

Nitrogen Division was formed June 1, 1952, by combining the Sales Agency Department of Barrett Division and the Nitrogen and Organic Sections of Solvay Process Division, Allied Chemical & Dve Corporation.

From its predecessors, Nitrogen Division inherited productive capacity, skilled personnel, long experience and an outstanding record of performance.

In addition to manufacturing uniform, high-quality products which exceed rigid specifications, Nitrogen Division devotes extensive facilities to the efficient distribution and effective utilization of these products.

Rapid, low-cost delivery is assured by the central locations of the two great Nitrogen Division plants at Hopewell, Virginia, and South Point, Ohio, supplemented by warehousing of some products at stock points conveniently located near markets.

Sales are handled by the offices listed below. In addition to experienced sales personnel, Nitrogen Division maintains a staff of technical experts whose services are available to customers without charge.



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NOVEMBER, 1952



# LINDANE

The following is a complete list of products available from KOLKER CHEMICAL WORKS, DIAMOND AL-KALI'S subsidiary, specilizing in organic chemicals for agriculture and industry:

DDT Technical
BHC Technical Grade
34% and 95% gamma)
LINDANE 95% gamma loomer
2,4-D Word Killers
K-101 Miticide

### KOLKER CHEMICAL WORKS INC.

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Plants: Newark, New Jersey and Houston, Texas



LINDANE, the effective multi-purpose insecticide containing 99% gamma isomer of benzene hexachloride is now available in commercial quantities. LINDANE, together with KOLKER high gamma BHC technical, now offer manufacturers basic BHC materials easily handled and readily formulated into high-quality finished insecticides.

DIAMOND ALKALI COMPANY

Chemicals you live by



HEAVY- DUTY
MULTI-WALL
PAPER BAGS
GO ALL THE
WAY TO DELIVER
THE GOODS



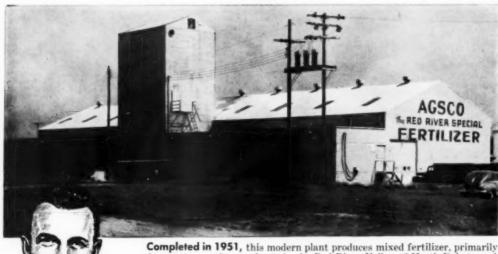
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Jaite Bags are made out of Super-Quality "Multi-Wall" Kraft Paper, including Moisture-Proof Sheets when necessary, In many Sewn and Pasted Types.

THE JAITE COMPANY

JAITE, OHIO



for potatoes and sugar beets in the Red River Valley of North Dakota and Minnesota. Agsco began distributing fertilizer here in 1934. Like many leading mixers, Agsco uses Spensol (Spencer Nitrogen Solutions).

### Dave Williams is manager of this Agsco Chemicals plant at Grand Forks, N.D.

# Agsco Fertilizer ... Another Spensol User



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17 BATTERY PLACE

Actual Hg

BIOLOGICAL TESTS OF MERCULINE SHOWING CONCENTRATION AT WHICH

FUNGUS GROWTHS START:

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Botrytis ....

Phomopsis

Disperihia

Scleratinia

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Fungus

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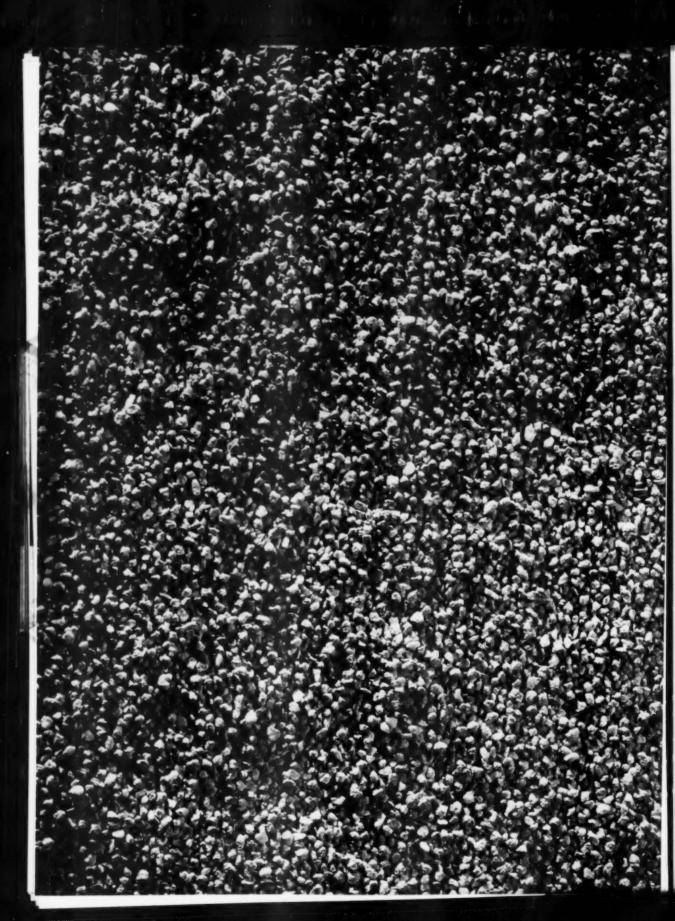
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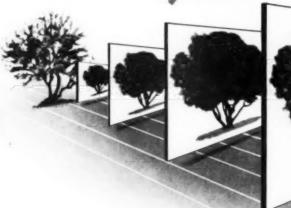
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Mineral deficiencies in crops have been with us like the unsolved crime down at the police precinct — only longer. Now, for the first time, research presents a bonn fide lead toward solving the fundamental problem of how to enable crops to assimilate minerals in which they are deficient and thereby promote better growth and bigger yields.

Sequestrene\* iron complexes have corrected one of the most difficult mineral deficiencies to cure, iron chlorosis. Field tests employing formulations of Sequestrene and ferrous sulphate on citrus have transformed yellow leaves to brilliant green and have infused a new rich growth in crops that were dying.

These changes were accomplished within four to six weeks after application and lasted for nine months and longer. The end-result is expected to be bigger yields of better quality.

Many research agencies are continuing to investigate the entire realm of mineral deficiencies including copper, zinc, cobalt, manganese, magnesium and other essential trace elements.

Those interested in the origin of the present work on mineral deficiencies should consult the publications of Stewart and Leonard (1) and Jacobson (2).

Geigy Company, Inc., Insecticide Division, are the exclusive sales agents for Sequestrene in the agricultural field. Write for technical bulletin, "Metal Complexes of Sequestrene" in Plant Nutrition", and pamphlets on iron chlorosis on citrus and reprints of papers by Stewart and Leonard, and Jacobson.

\*"Sequestrene" is the registered trademark of the product of Alrose Chemical Co., A Geigy Company.

(1) Stewart, Ivan and Leonard, C. D. Iron Chlorosis — Its possible causes and control. Citrus Magazine 14(10): 22:25, 1952. (2) Jacobson, Louis. Maintenance of Iron Supply in Nutrient Solutions by a Single Addition of Ferric Potassium Ethylenediamine Tetraacetate. Plant Physiol. 20(2):411-413, 1951.

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# THE EDITOR COMMENTS



EVOCATION of Sulfur Order M-69 by the National Production Authority on November 5 is a significant act. It relieves a great deal of pres-

sure under which both the fertilizer and pesticide industries have been operating for many months, and apparently gives the green light for all types of agricultural chemical production in which sulfur plays a part. Withdrawal of the reporting requirements of the order were announced at the same time.

When the sulfur order was first put into effect, in June, 1951, it appeared certain that production could not keep up with demand. But the sulfur-producing industry applied great ingenuity in increasing the output and the results are highly commendable. Above-ground stocks are reported large enough now to supply the industry's needs for more than seven months at the current rate of use.



S a partial answer to the problem of heavy pesticide inventories remaining at the end of a season, members of the trade have discussed the possi-

bility of using insecticides on a crop as a preventive measure before the insect pests appear. This "insurance" application would serve both the grower who would be assured of suffering no appreciable loss from insects, and the pesticide manufacturing trade which could maintain production without fear of a "bugless" season.

The argument states that fertilizer materials are being applied in many parts of the country as a regular part of growing a crop... the growers having learned that it pays to do so early rather than late in the season. Thus, why can't the same general idea be used in applying insecticides to crops to prevent serious infestation, rather than trying to stamp out an invasion after it has gained some headway?

H. G. Johnston, head of Research Development, the National Cotton Council, in commenting on the idea, says that such a program would be highly desirable if it were economical. But he doubts that we are ready for a full program of preventive application of insecticides.

"The nearest approach to this idea at present, is the so-called 'early-season' control program now being recommended in most of the cotton-growing states," he explains. "This program includes two to four applications of insecticides during the pre-bloom stage regardless of the severity of infestation. This idea, however, is based upon the fact that pests attacking cotton during this stage of growth are widely distributed and cause more or less serious damage every year. Furthermore, the cost per application during this season is comparatively low and can be justified on the basis of preventive measures or 'good insurance'."

The occurrence of insect pests later in the season is much more variable and dependent primarily upon prevailing weather conditions, Mr. Johnston continues. Research data have shown consistently that results obtained from the use of insecticides during this period are in direct proportion to the seriousness of the infestation.

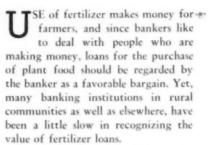
Applications at this time of year are more costly, and because a large number of them would be required, it is doubtful that such expenditures could be justified if made on a preventive basis only. Mr. Johnston concedes, however, that it is entirely possible that the development of improved insecticides and methods of application in the future may make such an approach to the problem possible.

The last statement is one to which the insecticide trade might give considerable consideration. Finding a way to make preventive use of insecticides more attractive to growers of cotton and other crops, would open the door to more stability in the business.

## Fertilizer Loans Make Money for All Concerned

# Warren Garst

Exec. Vice-President, Home State Bank, lefferson, Jowa



In a recent meeting of the American Farm Research Association, remarks were heard that "We've got to educate the bankers." No doubt there is a good deal of truth to that. Bankers held back on the first auto loans and let them go to the finance companies. They did the same thing on tractor loans. No doubt some are a little on the hold-back side on fertilizer loans.

Yet, when one investigates the matter further, it is evident that the main causes of the drag in making loans for fertilizer may include the financing of other things which may not bring the borrower nearly as great a return on his loan.

A young farmer was in our bank recently, stating that he was undecided whether to invest in more heifers to add to the holstein dairy Guest Editorial Written Especially for This Issue of Agricultural Chemicals



herd he is building. He could sell three old cows and buy heifers, and it looked like an idea which would bring returns, although he had no figures, other than guesses, to back up the assumption. He supposed that a fresh cow would milk out about the same amount that she would cost to buy. He thought that it might take half of that for feed, but allowed nothing for work or for depreciation on the cows.

It happened that his brother had run a fertilizer experiment for Iowa State College during the summer. The brother had applied 500 pounds of 12-12-12 on land that had been in corn for two previous years. On part of the area, he added 200 pounds of 33-0-0. The yield, according to the college estimates, was increased 50 bushels per acre. If a reasonable amount is allowed for the carry-over value of the fertilizer, the return would be something like 350% on the cost of the fertilizer!

The first brother had not stopped to figure the returns of a generous fertilizer application, but faced with such evidence, decided to build his herd from the heifer calves, to sell the three old cows and to put the money into fertilizer. This young man is almost

(Turn to Page 119)



HE Association of American fertilizer Control Officials has made outstanding progress during its first six years and the prospects are for even more progress in the future. Whether or not further advancement is made, depends almost entirely upon the degree to which members of the Association and others, participate in the development of uniform, well-considered principles and procedures for use by control officials in the discharge of their duties in the several States.

It is well to redirect our attention to the original purposes of the Fertilizer Control Officials' Association, as stated in the organization's constitution, which says that "The object of the Association shall be to promote uniform and effective legislation, definitions, rulings and enforcement of laws relating to the control of sale and distribution of mixed fertilizers and fertilizer materials on the continent of North America."

Two words in this statement of objectives need to be emphasized, and upon the degree of emphasis given to them depends the success and service of AAFCO. These two words are "uniform" and "effective". No one will argue with the concept that a law, to have any value at all,

must be effective. The word "uniform" carries with it a connotation of a group of individuals who behave in a similar manner in response to the same stimulus. The principal contribution this Association can make is to develop definite, workable procedures to use in given cases and then follow those procedures to bring uniformity of control across the continent. An excellent example of this is the development and universal use of the simplified registration form. Another is the principle that the last registered guarantor to handle the fertilizer is the party responsible for making the sales report and paying the inspection fee.

It is the responsibility of each control official to assume his full re-

### by

### J. F. Fudge

State Chemist, College Station, Texas. Presidential address before Association of American Fertilizer Control Officials, Shoreham Hotel, Washington, D. C., October 3, 1952 sponsibility in the development of these procedures and in the application of them to his own area. Only by so doing can maximum benefit be derived.

The AAFCO president has made a number of trips during the past year. At Houston, Texas, he appeared before the annual meeting of the directors of the State Agricultural Experiment Stations and discussed with them the resolution of the Association setting forth its position with respect to the marketing of mixtures of fertilizers and pesticides. The directors unanimously adopted the resolution in principle.

Later, a conference called by the Secretary of Agriculture in Washington for the purpose of developing a national program for more efficient use of lime and fertilizer, was attended. The great expansion in fertilizer manufacture proposed for the next few years presents certain questions which can best be answered only by the maximum cooperation of all groups concerned. While the program is primarily a joint Land Grant College-U. S. Department of Agriculture endeavor, the Association of Fertilizer Control Officials is certainly one of the interested groups.

While the Association mem-

bers can be of assistance to the program in many ways, there are two ways in which major contributions can be made to it. These are by the publication of adequate statistical data concerning fertilizer consumption in our several States and by encouraging insofar as may be consistent with our state fertilizer law, the limitation of grades of mixed fertilizers approved for sale in our state.

### Statistical Data Needed

THE importance of having adequate statistical data concerning fertilizer consumption is a matter which has been discussed a number of times before. The importance of such a report to all groups in any way connected with the fertilizer business cannot be over emphasized. Several states are now issuing such reports, but a number of others of marked importance in the national fertilizer economy have not yet done so. It is hoped that all states will soon have such a report.

### Should Limit Grades

NOTHER way in which this As-A sociation can be of marked benefit to the program is by the encouragement of limitation of grades of mixed fertilizer. This matter also has been discussed several times by this Association, and the committee on the development of the model law has made provision for this matter. Several States accomplish the same thing in other ways. Grades approved in the Southwest have been limited for over thirty years; annual hearings are held each year at which the agronomists, horticulturists, control personnel, and the fertilizer trade of Arkansas, Louisiana, Oklahoma, New Mexico and Texas present their ideas.

These annual grade hearings have been highly successful, not only because of the splendid spirit of cooperation among all of these groups which has resulted from meeting and knowing the members of the several groups. States in other areas, holding similar meetings in recent years, believe that this Association should for

Texas State Chemist points out problems involved in checking fertilizer grades, advocates limitation on number of grades sold and cites difficulties being encountered in checking presence of various soil conditioners in fertilizers. Bulk sales of plant foods also present added problem to officials. Broader statistical base needed for more accuracy.

ter and encourage meetings of this type. While the actual mechanics of approval differ among the several states concerned, the end result is identical in that practically all of the grades approved in one State are approved by all States in the area.

### Problems Ahead

S is usual in this group, there are A a number of problems which urgently need answers, but to which none are available currently. A few of these include the perennial question as to what types of products come under the fertilizer laws of our several states. The most pressing type this year is that of the polyelectrolytes being promoted for use as soil aggregate stabilizers. There is no question as to the great value of these materials when properly used, but a great many false and misleading statements about products of this type have been made in widespread advertising during the past year. (The subject of soil conditioners is discussed further by Allen B. Lemmon, Chief, California State Bureau of Chemistry, Sacramento, on page 37)

Representatives of a number of the major companies making this type of product have discussed this matter with the Association president during the past year; most of these men were definitely of the opinion that the fertilizer control officials should take jurisdiction over the sale of these materials under the same legal requirements as are current for the usual fertilizer constituents. It appears probable that they could be included under the legal definitions of fertilizers as given in the laws of states, while they could not do so under the legal definition in the laws of other states. Certainly something should be done about these materials, and we should give careful thought to the whole situation.

The problems presented by the sale of fertilizers in bulk to custom distributors are already complex and pressing, and will become more so, for this is a rapidly growing practice in most parts of the country. Adequate provisions can be made for labeling to be attached to the bill of sale, but the matter of weights cannot be handled so easily. Neither can the matter of adulteration after the fertilizer has left the guarantor's dock. In Texas, we handle the matter by prohibiting sales in bulk to anyone except to a farmer for use on his own land; the fertilizer guarantors register every dealer handling bulk goods as an agent of their company and consequently assume responsibility for any violation which the dealer commits. Consequently, we have the guarantor doing very efficient work in policing the situation. This organization has worked very well, but might not work so well under other conditions. At any rate, it must be emphasized that bulk sales of fertilizer is a very important practice now and will become much more important, and it seems necessary that this Association develop some well-considered, widely-adaptable principles for control procedures to be followed in this connection.

#### Minor Element Problem

7 ITH the greatly expanded use of much larger amounts of much purer materials which supply nitrogen, phosphorus, and/or potassium, the matter of what to do about secondary and minor elements in fertilizers is going to become important. There is no doubt that these elements are limiting under certain conditions and on certain areas. We need to develop broad, workable principles for procedures for considering the labeling permissible for these elements, without allowing the gates to swing sufficiently wide so that we have no control over the claims and guarantees made. This is particularly true of the minor elements. Our current position with respect to these is that no claims or guarantees may be made for these unless they are present in the fertilizer in water-soluble form in sufficient quantity to be of agricultural significance. We have not developed any agreement as to just what those quantities are. Such a position has much to be said for it, but there are also things to be said against it.

Compounds bearing these elements in water-soluble compounds may be added to fertilizer mixtures of such character that the elements will be changed to water-insoluble compounds. The elements may be in water-soluble compounds in the fertilizer, but be changed rapidly to insoluble compounds when the fertilizer is applied to alkaline soils. The simple fact is that in nearly all cases these minor elements should be applied in a foliar spray rather than in fertilizer mixed with the soil. This whole problem is highly complex. We definitely need to consider it carefully and develop a uniform procedure for handling these questions as they arise.

#### Soil Conditioners in Fertilizer?

By Allen B. Lemmon

URING the past 100 years, the fertilizer industry has developed from a group handling organic waste products, to part of a tremendous chemical industry. Increases in tonnage have been noted each year, but there are still those who view with alarm and misgivings, the use of chemicals in the soil.

On the whole, however, the people generally have accepted commercial fertilizers, but at the same time have been waiting for some substance that would make the soil workable and easily handled, or to lend to it that quality known as "tilth."

When the first announcement was made of a polyelectrolyte soil amendment in 1951, some regarded the claims with some skepticism. Knowing how much peat, straw, manure or similar material is required to change the physical condition of some soils, it seemed impossible that a chemical in small amounts, could do a better job. On the other hand, our faith in the chemical industry and in the company introducing the material, made the story much more plausible. Probably none of us visualized how the public's fancy would be attracted to the idea of a chemical soil conditioner. The comments, questions and general enthusiasm about it were reminiscent of the advent of DDT.

As might be expected, this stir resulted in many other firms becoming suddenly interested in promoting materials for soil conditioning, and some of the claims of these concerns have been unquestionably extravagant.

Control officials were somewhat confused with the exact chemical composition of the various polyelectrolyte soil amendments. The first publicity termed the materials a "synthetic polyelectrolyte" and a little more specifically, as "the sodium salt of hydrolyzed polyacrylonitrile." But by the time the material was marketed, the firm announced that the formulation had been changed and the

material was actually "a modified vinyl acetate maleic acid compound."

The matter was complicated further by the statement by this manufacturer, that its brand name was eventually to be applied to a series of soil conditioning compounds which may or may not be related chemically.

Another primary manufacturer describes the effective ingredient in its formulations as "hydrolyzed polymer of acrylonitrile." Other makers use "hydrolized polyacrylonitrile "or "sodium polyacrylate." None of these terms is sufficiently informative to provide a picture of what the materials actually are, and the confusion of terminology is characteristic of the general confusion surrounding the labeling, marketing and the use of these new soil amendments.

It is claimed that the primary effect of this material on ordinary soil is at once to stabilize clay aggregates against the disbursing or slaking action of water. We all recognize that almost any soil with sufficient mechanical labor and proper timing of cultivation can be worked into a loose porous condition. It is only the soils with good tilth that retain this aggregate structure when subjected to rainfall or extensive irrigation. The basis of the soil conditioning effect, we are told, is to bind the small particles of clay together in such a manner as to maintain the aggregating effect.

These new polyelectrolyte soil conditioners generally do not come under our State fertilizer laws, although California law classes them as soil amendments. This is the same class into which fall materials such as hay, straw, peat, leafmold and sand when applied to the soil. No registration is required and no specific labeling requirements are set forth in the law but general provisions such as those making it illegal to misrepre-

Dr. Lemmon, Chief, California State Bureau of Chemistry, Sacramento, presented this paper before Fertilizer Control Officials, Washington, D. C., Ort. 3, 1852.

sent a product do apply in California. This means that instead of having opportunity to review labeling and proposed literature before the products are offered for sale in the State, we can only wait until the products are sold and then take action if false claims are made. Many of the major distributors of the new soil conditioners have regularly handled commercial fertilizers and economic poisons in our State and take it for granted that we can be helpful in connection with labeling new products. They have sent us copies of their proposed labels and literature and keep us informed with regard to their proposed operations even though the law does not require it. Others have waited for us to catch up with them.

On account of the small-size packages that are distributed at a high price, mail order business has been carried on extensively by several firms. It is particularly difficult to control the claims and the labeling of products handled in this way. Probably the best we can do is to keep the Federal Trade Commission and the United States Post Office informed when we see false statements made in promoting these materials.

In our opinion, this class of materials should be required by law to be registered before being offered for sale in a state. We have been told that some of the manufacturers doing business in California plan to bring the matter to the attention of the Legislature with a recommendation that registration be required by law.

The agricultural chemicals industry has struggled with the various laws governing sale of these materials in the various states, and may not always see eye to eye with the enforcement official, but it has found that there are advantages in having reasonable administration of strong laws to prevent disorderly marketing of products with false claims. The laws not only protect the users from unscrupulous promotors, but also protect the legitimate marketer from unfair competition by deficient, unsatisfactory products. New developments of this kind may unfortunately attract a few fly-by-night firms that may try to move into the fairly stable field of agricultural chemicals and make a short campaign and a quick killing at the expense of credulous buyers.

Getting back to polyelectrolyte soil amendments, liquid products and dry products can differ greatly in effective content. No ingredient statements are required by law and one firm may offer a material of 10% strength in competition with another of 20% strength and no one knows the relative value of the two products unless he is in a position to make his own evaluation. Of course the prob-

(Turn to Page 97)

TABLE I
Analyses of Polyelectrolytic Soil Conditioners

			,						
	Brand Name	Firm Name		Content, %		Proximate Anal			pH
			Tetal N	P <sub>2</sub> O <sub>5</sub>	Total K <sub>2</sub> O	Moish	ire Ash	Organic Matter	1-100 dilution
1	Ortho-Til Powder	California Spray-Chem. Corp.	1.09	0.45	0.18	2.57	74.79	22.64	11.0
2.	Ortho-Til Soluble	California Spray-Chem. Corp.	4.57	nil	0.15	4.75	39.28	55.97	7.6
3.	Terra Kem	Niagara Chemical Div., Food							
		Machinery & Chemical Corp.	3.94	nil	0.22	6.88	38.43	54.69	9.0
4.	Aerotil Soil Conditioner								
	Wettable Flakes	American Cyanamid Company	4.39	nil	0.20	4.79	39.45	55.76	7.9
3.	Aerotil Soil Conditioner								
	Dry Form	American Cyanamid Company	4.29	nil	0.31	4.64	61.11	34.25	9.5
6.	Krilium Soil Conditioner	Monsanto Chemical Company	0.09	nil	0.27	8.42	66.05	25.53	3.9
7.	Krumbl-Soil	Plus Products	0.61	trace	0.30	1.64	76.65	21.71	5.4
8.	Nott's Soilife	Nott Mfg. Co.	4.96	nil	0.18	4.32	37.77	57.91	7.4
9.	Du Pont Soil Conditioner	E. I. du Pont de Nemours							
		and Company	4.36	trace	0.29	2.65	39.37	57.98	7.9
10.	Nott's Soilife	Nott Mfg. Co.	4.13	nil	0.38	4.30	39.07	56.63	8.0
11.	Agrilon P	American Polymer Corp.	1.43	0.10	0.38	6.22	73.73	20.05	6.4
12.	Agrilon N-Dry	American Polymer Corp.	6.56	nil	0.32	5.26	24.79	69.95	5.8
13.	Nn-Soil	United Chemical Company	1.40	nil	0.03	77.93	6.15	15.92	8.1
14.	Flutfium	Garden Products Mfg., Div.							
		Henry A. Dreer, Inc.	0.75	nil	0.01	76.82	9.02	14.16	8.4
15.	Soiloam	W. A. Cleary Corp.	2.76	nil	0.13	79.15	7.29	13.56	6.2
16.	Red Star Soiloam	Downey Fertilizer Company	0.93	nil	0.10	91.35	2.06	6.59	10.3
17.	Agrilon NA	American Polymer Corp.	1.23	trace.	0.12	84.73	4.25	11.02	7.4
18.	Kemisoil	Acorn Chemical Co.	1.12	trace	0.02	89.56	1.90	8.54	7.5

"Moisture" is loss at 100" C. for 4 hours. "Organic Matter" is loss on ignition.

NOTE: Item Nos. 13 to 18 inclusive are liquid products. Their densities in lbs/gal @ 68° F. are 9.22, 9.63, 9.29, 8.73, 8.95 and 8.78 respectively.

Progress and Prospects in the

## Chemical Control of Nematodes

by a. C. Taylor

U.S. Department of Agriculture Bureau of Plant Industry, Soils and Agricultural Engineering, Beltsville, Md.

ALES of chemicals for the control of nematodes amount to several million dollars each year. The greater part of the development of the business has taken place in the past 8 years, though chloropicrin was promoted for this purpose as early as 1936, and experiments on control of nematodes by chemicals were reported in Germany over 75 years ago. The nematocides used most extensively are the soil fumigants, dichloropropene-dichloropropane mixture, ethylene dibromide, chloropicrin, methyl bromide and chlorobrompropene. In addition, small amounts of sodium selenate, parathion and urea are used.

As the nematocide business has expanded, a considerable amount of information about the effects of chemicals on nematodes and other soil organisms and about the effect on the growth of crops of the control of soil pests has been accumulated. Much effort has gone into development of techniques and machinery for the application of the fumigants and into the location and development of markets.

Soil fumigants have been found to be effective for the control of soil pests other than nematodes. All of

In the photo: Celery field, near Sanford, Fla. The right hand portion of field was fumigated with a dichloropropene fumigant for nematode control and the left half was not. (Photo by Shell Chemical Corp.)



the fumigants will control certain soil insects, such as wireworms, and all have some effect on other soil organisms. So far as the dichloropropene and ethylene dibromide fumigants are concerned, this effect is not sufficient to warrant the recommendation of their use for control of bacteria, fungiand weed seeds, but chloropicrin, methyl bromide and chlorobromopropene are very effective for this purpose.

In general, it is comparatively easy to kill 90% to 95% of the nematodes and other soil pests in many types of soil, but difficult or

economically impractical to obtain satisfactory results in some of the heavier soil types. On the other hand, it has been found that complete extermination is seldom necessary in order to obtain very satisfactory increases in yields of annual crops. Consequently, commercial applications of soil fumigants are not designed to kill all of the pests, but to reduce their numbers sufficiently so that a satisfactory crop can be grown. The optimum application of soil fumigant is the amount which produces the largest increase in the value of the crop per dollar invested in soil fumigation.

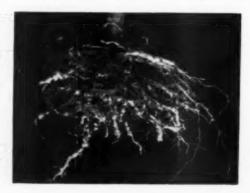
With most crops, it is more efficient to apply moderate amounts of soil fumigant before each crop rather than to apply larger amounts in the hope that more than one crop can be grown before it is necessary to repeat the application.

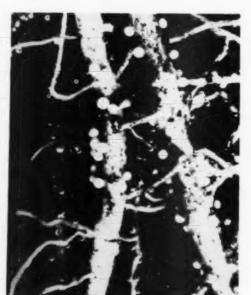
In a very large percentage of trials where soil fumigants have been applied under favorable conditions, increases in crop growth and yield ranging from 20% to several hundred per cent have been observed. Where the soil is heavily infested with nematodes or wire worms, fumigation of the soil has often made the difference between a good crop and one not worth harvesting. Usually, the value of the crop is increased by improvement in quality.

#### Phytotoxicity

NE of the disadvantages of the present soil fumigants is that they are more or less toxic to plants and must be applied some days or weeks before planting so they will have time to diffuse out of the soil before the crop is planted. This interval varies according to the type and amount of fumigant used and the temperature and moisture conditions of the soil, but for normal amounts of fumigant and ordinary soil conditions, two weeks is sufficient. Reports of poor growth of plants after soil fumigation can nearly always be traced to use of excessive amounts of fumigant, or to failure of the fumigant to diffuse out of the soil because of abnormal weather conditions.

Soil fumigants affect to some degree the beneficial soil organisms, but serious trouble due to this is seldom encountered. Like the plant parasitic soil inhabitants, these are not exterminated, and can multiply rapidly once the fumigant has dissipated from the soil. The nematodes are obligate parasites and cannot reproduce at all until the crop is planted and living roots are available on which they can feed. There has been no evidence that even repeated applications of soil fumigants produce undesirable changes in the biotic complex of the soil, or that phytotoxic chemical residues of the fumigants accumulate in the soil.





(Above): This

tobacco root shows characteristic galls produced by root-knot nematodes in heavily-infested soil. Such roots are unable to make efficient utilization of fertilizer and soil moisture. (U.S.D.A. photo)

(Lower photo)

Magnification photo showing cysts attached to roots. Such conditions greatly retard plant growth and development. (Photo by Cornell University) **Application Methods** 

UMEROUS methods of applying liquid soil fumigants have been tested, including application of emulsions to the soil surface and dispersing the fumigant in irrigation water, but except for special uses, the injection method has been most efficient. This involves placing the fumigant 6 to 8 inches beneath the soil surface, usually in lines about a foot apart. Machinery for this purpose has been standardized and is readily obtainable. Two principal types of applicators are used for large scale work. One of these delivers the fumigant through tubes attached to shanks which move through the soil at the required depth. The other delivers the fumigant to the bottom of the furrow during plowing. Accurate metering of the fumigant is accomplished by flow at constant pressure through calibrated orifices, the pressure being furnished by pumps on the larger machines and gravity flow on the smaller ones. Displacement pumps with adjustable stroke are also used for metering. Shank applicators are made in any size desired, but the majority are mounted on standard farm tractors and have six or eight shanks. Hand applicators of several types are used for small areas. Pure or 98% methyl bromide, being a gas at ordinary temperatures, is applied by a special method. A paper or plastic cover is placed over the plot but supported a few inches above the soil surface. The edges of the cover are buried. The methyl bromide is released between the cover and the soil surface

For nematode control, where the whole area of the field is to be fumigated, the usual application of dichloropropene soil fumigant is 20 gallons per acre, and the usual application of 41% ethylene dibromide fumigant is 15 gallons per acre. The cost of these applications, including an allowance for the labor of applying, is about \$35,00 per acre. If the crop is to be planted in rows more than three feet apart, good results can be obtained by application of fumigant to the rows only, with savings of more than half the cost.

Obviously, if soil fumigation is

to be an attractive investment for the grower, it must increase income from the crop sufficiently to pay for the fumigant and the labor of application plus a reasonable profit. Since there are many risks in the growing and marketing of crops, the grower is seldom interested in increasing his expenses unless there is a fair prospect that the returns will be three or four times the investment. Where soil fumigation at \$35.00 per acre is concerned, this means that the crop yield and quality increase must be worth more than \$100.00 per acre. As a general rule, increases of this magnitude can be obtained only with crops having a total value of \$300.00 to \$400,00 per acre or more. Even the less expensive row fumigation is seldom used for crops of less than this value. Chloropicrin, methyl bromide

and chlorobromopropene are all much more expensive than dichloropropene and ethylene dibromide fumigants, so their use is confined to greenhouses, nurseries, seedbeds and crops of unusually high value.

The development of markets for soil fumigants requires a considerable amount of time and effort, even where conditions are favorable for their use. This is readily understandable when it is realized that soil fumigation is a comparatively new technique in farming and unlike anything that has been used previously. Furthermore, many growers are unfamiliar with the nematode problem or with the problem of soil pests in general. Nematode damage increases slowly over a period of years and is often ignored or mistaken for declining

(Turn to Page 123)

In the photos:

(Top) Six cucumber roots from soil infested with root-knot nematodes. Note the impoverished appearance, as compared to the way normal roots should look.

(U.S.D.A. Photo)



(Lower picture):

Two tobacco roots from the same field in South Carolina. The one on the left came from part of the field which had been fumigated for nematode control, while the one on the right was grown outside the fumigated area. (Photo by Shell Chemical Corp.)





## NFA

## In Miami Beach Meeting

November 19-21

EATURING a symposium on ammoniation technology as well as speakers representing industry, the U. S. Department of Agriculture, State Experiment stations and other allied institution, the National Fertilizer Association expects the largest convention crowd in its history when it meets for three days at the Roney Plaza Hotel, Miami Beach, Florida. The sessions will begin November 19 and will continue through the 21st.

The 26th annual fall meeting holds its first general session on Thursday, November 20. Speakers scheduled to appear on the program that day and the next include W. N. Watmough, Jr., vice-president, Mixed Fertilizer Division, The Davison Chemical Corp., Baltimore, Md., who will discuss the problems of safety in the fertilizer industry; A. H. Moseman, chief, Bureau of Plant Industry, Soils and Agricultural Engineering, U. S. Department of Agri-

culture, Beltsville, Md., who will deal with "New Foundations for Tomorrow's Agriculture": Warren Garst, executive vice-president. Home State Bank, Jefferson, Iowa., to speak on the relationship between bankers and fertilizer industry (see guest editorial, this issue, page 34); W. M. Fifield, director of the Florida Agricultural Experiment Station, Gainesville, Fla., who will discuss the relationships between state experiment stations and the fertilizer industry; and W. R.



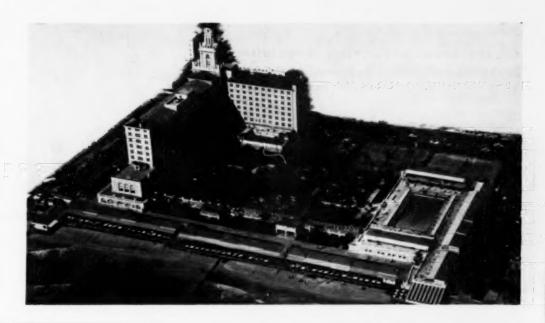
Top of page: Dr. Russell Coleman, president, National Fertilizer Association, Washington, D. C.

Left: Dr. W. M. Fifield, who discusses the relationships between experiment stations and the manufacturing industry.

Right: Dr. A. H. Moseman, who speaks November 20 on "New Foundations for Tomorrow's Agriculture."



AGRICULTURAL CHEMICALS



Allstetter, vice president of the National Fertilizer Association, "Observations on Recent Fertilizer Developments and the Future Outlook."

#### Symposium Friday

ONE of the convention's highlights will be the symposium on ammoniation technology scheduled for 2 o'clock Friday afternoon at the Roney Plaza. The symposium, sponsored by the National Fertilizer Association's subcommittee on Chemical Processing and Manufacturing, will have on its panel four authorities on the subject. These men include the following:

T. C. Rogers, Nitrogen Division, Allied Chemical & Dyc Corp., who will discuss "Ammoniation of Normal Superhposphate"; Joseph C. Sharp, Spencer Chemical Co., Kansas City, Mo., "Ammoniation of Triple Superphosphate"; O. F. Jensen, E. I. duPont de Nemours & Co., Inc., Wilmington, Delaware; and W.

E. Schaffnit, Stedman Machinery & Equipment Co., on "Ammoniation Equipment and Techniques." The symposium will be held in the Roney Plaza Hotel, headquarters for the entire convention.

A social hour tendered by H. J. Baker & Bro., New York City, will precede the annual Fall Meeting Banquet scheduled for Thursday evening, November 20.

> According to the Association, (Turn to Page 99)



NOVEMBER, 1952

Above: The Roney Plaza Hotel, site of the 1972 fall meeting, National Fertilizer Association.

Left: W. N. Watmough, Jr., Davison Chemical Corp., Baltimore, Md., who discusses problems of safety in fertilizer plants.

Right: W. R. Allstetter, vice-president, the National Fertilizer Association, Washington, D. C., who speaks on recent developments in the fertilizer field and the future outlook in the industry.



## Testing Systemic

GREAT deal of interest is being shown presently in the so-called systemic insecticides, The idea of controlling insects by injecting substances into infested plants is many centuries old, and a number of claims for the discovery of systemic insecticides are found in the literature. However, the method has seldom lived up to claims made for it, and the very name has fallen into more or less disrepute. This is because no suitable materials were available until recently, and certain recent claims have disregarded the important factors of specificity of the compounds for certain species of insects and the matter of dosage. Systemic insecticides require a higher dosage than most insecticides in use today, and consequently, may be too costly to compete with materials and methods now recommended.

For protection against insects with currently recommended insecticides, cotton plants must often be treated as many as eight or more times during the growing season. New fruit and foliage that need protection are constantly being produced. Dust and spray deposits are washed off by rain, blown off, or disappear by volatilization. Boll weevil, bollworm, and pink bollworm larvae develop inside squares and bolls and are difficult to control. Cotton growers would benefit more than almost any other agricultural group by the development of a systemic insecticide suited to their needs.

It was for these reasons that an intensive research program on systemic insecticides was started in 1949. This program was sponsored cooperatively by the Bureau of Entomology and Plant Quarantine and the Texas Agricultural Experiment Station, and carried on at the laboratory at College Station, Tex., where new insecticides are screened for effectiveness against cotton insects. Hundreds of compounds have been tested for systemic action against several important cotton pests and the methods used in research will be described in this article. Results obtained with some of the most interesting compounds will be given in two later installments.

Methods for testing systemic insecticides have been described by David and Gardiner (1951), Ripper et al. (1950), Schrader (1947), Smith et al. (1950), and Wallace (1951).

#### **Laboratory Screening Tests**

ASIMPLE laboratory procedure has been developed by which 25 or 30 compounds can be screened for systemic property each week. Cotton seedlings are sprouted in sand and then transferred to 8-ounce jars containing 180 ml. of a mixture of Hoagland's complete nutrient solution and various concentrations of the test compound. These seedlings are grown

in the mixture for one week. Fifteen plants are grown in each jar, and they will use up practically all the mixture in one week's time.

Water-insoluble compounds are formulated with xylene or other suitable solvent and an emulsifier, and then diluted with water. Each compound is usually tested at four concentrations — 1000, 100, 10, and 1 part per million. Since the plants are frequently killed at the higher concentrations, they are tested at the highest concentration at which the plants survive. If a compound does not show systemic action at a high concentration, it is not retested at the lower levels.

Treated plants are tested against the different species of insects in various ways. Mites and aphids on infested leaves are placed on the test plants, so that they may become infested, and live mites or aphids are counted at various intervals. Boll weevils, bollworms, cotton leafworms, and similar active insects are confined in plastic-screen cages placed over treated plants growing in nutrient solution. Thrips are placed on a section of the treated leaf in a small rearing cage constructed of two microscope slides.

Other factors considered in the evaluation of systemic insecticides are the minimum dosage required for effective insect control, the time that the treatment remains effective, and possible plant injury from use of the compound.

lReport of a study made under the Research and Marketing Act of 1946, in cooperation with the Texas Agricultural Experiment Station.

## Insecticides

#### Soil Tests

IN the first tests with systemic in-secticides conducted by Schrader (1947) in Germany, aqueous solutions of the insecticide were poured on the soil. This method wastes material, however. For example, 8 to 16 pounds of schradan\* is required per acre for cotton aphid control when the compound is watered into the soil. Comparable results may be obtained with a spray containing only I pound per acre. In addition, the spray kills much more quickly, although it is not so long-lasting. The soil-treatment method has been tested with a number of other systemic insecticides, and the rate of application required for effective control has always been much higher than for foliage application. For this reason soil tests have been largely abandoned in our work with cotton insects. However, for a few special applications, such as on fruit trees or ornamental or greenhouse crops, soil application of systemic insecticides may find a

#### Spray Tests

THE most common method of applying systemic insecticides is by spraying them on the plants. In this work there is no question as to the superiority of sprays over dusts. Dusts made by impregnating Attaclay with schradan were completely ineffective against spider mites and aphids, whereas a single spray application of

1 pound of schradan per acre gave complete aphid and mite protection for two to four weeks.

For the spray tests the calculated quantity of insecticide required to make up the desired volume of spray emulsion is weighed out. Since many of the compounds are available in small supply, only the amount of emulsion required for a small laboratory sprayer is made up. When the supply of chemicals has been conserved carefully, as many as a hundred or more tests on 8 or 10 species of insects have been made with a single 2-gram sample of insecticide. After the chemical is weighed, it is dissolved in xylene and an emulsifier is added, followed by water to give the desired

In connection with these spray tests, it should be pointed out that one cannot know how much of the insecticidal activity of a compound is due to its systemic action and how much to contact, stomach poison, or fumigation effect. Even if the plants kill insects for several days or weeks after the application, we cannot be certain that the action is due to systemic rather than to residual toxi-

#### by

#### E. E. Ivy

U. S. Department of Agriculture Agricultural Research Administration Bureau of Entomology and Plant Quarantine, College Station, Texas city. It is therefore necessary to confine insects to new growth produced after the application of insecticide to see whether true systemic action exists.

#### **Seed-Treatment Tests**

THE greatest obstacle to the commercial use of systemic insecticides on a crop such as cotton is the expense in comparison with methods and insecticides now recommended. The most promising method from the standpoint of economy of materials and ease of application appears to be seed treatment.

One pound of schradan used to treat 100 pounds of cottonseed will control aphids and mites for six weeks. The seeds are soaked for an hour or so in a solution of this insecticide. Reduction in germination resulting from this treatment ranged from 10 per cent in greenhouse tests to about 40 per cent in certain field tests. Most of the systemic compounds are more toxic to seedlings than is schradan.

Dusts made by impregnating Attaclay with the materials were ineffective. Recently, activated charcoal was used as a dust carrier with very promising results. Compounds that were not tolerated by the seed even at low concentrations when applied as solutions or emulsions were tolerated at 8 to 16 pounds per 100 pounds of seed when impregnated with activated charcoal. A 50 per cent concentration of charcoal is about the highest that is practicable. Solid insecticides can be dissolved in acetone, then mixed with charcoal, and the acetone evaporated. After being treated, the seed are planted and the plants tested for insecticidal action as in the other tests.

#### Tests for Toxic Vapors

IN connection with the nutrientsolution tests with these compounds, the question arose whether
there was true translocation through
the plant tissues, or whether the
plant's toxicity was due to adsorption
of vapors arising from the insecticide
in the nutrient solution in which the
plants were growing. Sap from treat-

(Turn to Page 121)

<sup>\*</sup>Common name for octamethylpyrophosphoramide (OMPA), product of Pest Control Ltd., London, England.



A NEW method of producing the herbicide, 2,4,5-T from waste products from the manufacture of been worked out by the Galat Chembeen worke out by the Galat Chemical Corporation, Yonkers, N. Y., according to Alexander Galat, head of the firm.

Whereas the process currently used in making 2,4,5-T starts with ortho-dichlorobenzene, the new process starts with the wastes of BHC manufacture, (alpha-beta mixture), which, on heating with an ion-exchange resin, gives 1,2,4-trichlorobenzene. Sulfonation, treatment with caustic soda in water, hydrolysis and chlorination give 2,4,5-trichlorophenol, which is condensed with chloroactic acid to yield 2,4,5-T, it is explained.

Dr. Galat points out that the new process has an abundance of raw material with which to work. As compared with ortho-dichlorobenzenc, itself a valuable product, and thus not very plentiful, the alpha, beta mixture is a waste product of BHC manufacturing and is more than plentiful since large accumulations of this material have collected at the plants of many BHC makers. Other companies have the material taken away as waste.

Describing the yields, conversions and equipment needed to use this process, Dr. Galat says that in current methods, the chlorination of dichlorobenzene into tetrachlorobenzene, gives conversions of about 15% per pass. This low conversion is a production bottleneck partly responsible for the high costs of material manufactured by this method.

In the new process, by comparison, none of the steps involves a conversion lower than 70% according to tests made thus far.

The reaction of tetrachlorobenzene with caustic soda, the second step of the currently-used procedure, requires the use of autoclaves, high pressures and organic solvents, making necessary rather high capital investments and greater production costs. In the new process, Dr. Galat says, the reactions are all run in aqueous media, thus eliminating the cost of a solvent recovery plant, the cost of the solvent recovery and the cost of the solvent loss. The short pressure step of the new process can be run in pipes as a continuous operation, thus avoiding the use of autoclaves.

The new process is now being investigated on a pilot plant scale by a number of BHC manufacturers, to determine whether it will offer advantages from the point of view of raw-material cost and availability, overall yields and conversions and capital investment.

Manufacturers of BHC may find new outlet for waste products of process, as basic raw material for making 2,4,5-trichlorophenoxyacetic acid. New method of making 2,4,5-T saves on both materials and necessary equipment in continuous operation.

# Now Chemical Advancements Create Problems Discussed as Control Officials Meet

POUR groups of control officials held a week-long meeting at the Shoreham Hotel, Washington, D. C., September 29-October 4. The organizations included the Association of Official Agricultural Chemists; the American Association of Feed Control Officials; the American Association of Fertilizer Control Officials; and the Association of Economic Poisons Control Officials.

The following officers were elected at the meetings:

#### AOAC

President: Dr. H. J. Fisher. Connecticut Agricultural Experiment Station. New Haven. Conn.

Vice-president: Dr. E. L. Griffin. Insecticide Division. U. S. Department of Agriculture, Washington. D. C.

Secretary-treasurer: William Horwitz. Food and Drug Administration. Federal Security Agency. Washington. D. C.

The following were elected to the executive committee: W. F. Reindollar. Baltimore. Md.: K. D. Jacob. U. S. Dept. of Agriculture. Beltsville. Md.: M. T. Etheredge. State College. Mississippi: and the retiring AOAC president. Henry A. Lepper. Food and Drug Administration. Washington. D. C.

#### Feed Ass'n Election

President: J. D. Patterson, Salem. Oregon, to succeed F. W. Quackenbush, Lafayette, Ind.

Vice-president: Stacy B. Randle. New Brunswick, N. J.

Secretary - treasurer: Henry A. Lepper, F.D.A., Washington, D. C. Named to the executive committee were G. W. Michael, Ottawa, Canada; E. A. Epps, Baton Rouge, La.; and

John L. Monaghan. Topeka, Kans.

#### Fertilizer Officials

President. P. A. Yeats. Oklahoma City. Okla.. succeeding Dr. J. F. Fudge. College Station. Texas.

Vice-president, Henry A. Davis, Durham, New Hampshire, Secretary-treasurer, Dr. Bruce D.

Cloaninger, Clemson, S. C.

Elected to the A.A.F.C.O. executive committee were H. R. Allen, Lexington, Ky.: and M. P. Etheredge, State College, Miss.

Photos Below
Left: Newly-elected officers of the Association of American Fertilizer Control
Officials: Henry A. Davis, Durham, New
Hampshire, vice-president; P. A. Yeats,
Oklahoma City, Oklahoma, president; and
Dr. Bruce D. Cloaninger, Clemson, S.C.,

secretary-treasurer.
Right: Dr. A. B. Heagy, College Park,
Md., secretary-treasurer of the Association
of Economic Poisons Control Officials;
Dr. Rodney C. Berry, president: and
Floyd Roberts, Bismarck, N.D., vice-presi-

#### Economic Poisons Election

President Rodney C. Berry, Richmond, Va., succeeding E. W. Constable, Raleigh, N. C.

Vice-President: Floyd Roberts. Bismarck, N. D.

Secretary-Treasurer, A. B. Heagy. College Park, Md.

#### Feed Officials Meet

I N its two-day session, October 1 & 2, the Feed Control Officials heard committee reports, investigators' reports, saw a colored sound movie, "The Story of Menhaden" and heard a number of technical papers. Dr. F. W. Quackenbush in his presidential address, discussed "What Constitutes Progress in Regulatory Work"; and J. D. Sykes, chairman of the board, American Feed Manufacturers Association, Chicago, talked on "The Boss and the Unseen Tag."

A total of twenty-six investigators' reports were presented during the first afternoon.

Thursday's program, in addition to the showing of the movie, included papers by Howard O. Sturgis, manager, By-Products Dept., Gorton-





Pew Fisheries Co., Ltd., Gloucester, Mass.; Dr. C. R. Grau, Division of Poultry Husbandry, Univ. of California, Berkeley; Ray O. Bowden, executive vice-president, Grain & Feed Dealers National Association, Washington, D. C.; A. W. Carpenter, executive director, Eastern Federation of Feed Merchants, Inc., Sherburne, N. Y.; and C. W. Sievert, C. W. Sievert and Associates, Chicago, Illinois.

## Fertilizer Officials

FOLLOWING the state roll call (38 states were represented by 62 officials, it was reported) Dr. Fudge presented his presidential address, reviewing the activities of the past year. He pointed out the new problems being encountered by control officials in sampling and testing

the weight of bulk materials which he said are being used more and more, and discussed briefly the labeling of fertilizer materials in which other items are included such as soil conditioners and insecticides.

Dr. Russell Coleman, president, National Fertilizer Association, Washington, D. C., reviewed fertilizer consumption figures of the past years, showing percentages and tonnages on slides to indicate a changing picture, with the midwestern states coming more and more to the front as fertilizer users. (See charts on Page 105)



(Left): A. L. Mehring and Fred C. Lodge, both recently retired, were honored by the National Fertilizer Association at its dinner held at the Shoreham, October 2, for the Fertilizer Control Officials.

Mr. Mehring (left) was for many years connected with the U.S. Department of Agriculture and Mr. Lodge was secretary-treasurer and at one time acting president, of the National Fertilizer Association, Washington, D.C.

Below: Part of head table at dinner given by the American Plant Food Council at Wardman Park Hotel in honor of the control officials on October 3. Left to right: Henry A. Davis, A.A.F.C.O. vice-president; P. A. Yeats, A.A.F.C.O. president; Dr. John R. Taylor, Jr., agronomist, American Plant Food Council, who presided at the dinner program: Dr. J. F. Fudge, College Station, Texas, retairing president, Fertilizer Control Officials; Faul T. Truitt, Council president: Allen B. Lemman and Dr. Rodney C. Berry, both past presidents of the A.A.F.C.O.







Bottom row: Dr. M. H. McVickar, agronomiet, National Fertilizer Association, Washington, D. C.; and Dr. H. B. Siems. Bruce D. Cloaningwe, Clemeon, S.C.; W. A. Minor, assistant to the Secretary of Agriculture, Washington, D. C.; W. A. Barnette, Clemson, S. C., trustee of Clemson College; and Dr. M. D. Farrar, Clemson.

below the state recommendations, he said. This need for attaining the state recommendations is undoubtedly one reason why the U.S.D.A. has been so interested in helping the fertilizer industry to expand production.

If state fertilizer recommendations could be met, corn would require more than 6 times its present fertilizer use; cotton, wheat and other cross also offer opportunity for further fertilizer use. The four crops used to illustrate the increased potential—cotton, corn, wheat and pastures, currently use about half the total fertilizers applied in the United States. If the state fertilizer recommendations could be attained on these crops, they would require 2½ times more fertilizer than is used currently.

"We fell that potential usage on these crops, as well as others, offers a real opportunity to improve the farmer's lot, to provide the increasing amounts of food needed for our population and to improve our national welfare generally," he concluded.

(Turn to Page 105)

## Economic Poisons Control

AN address by Dr. E. W. Constable, retiring president of the American Association of Economic Poisons Control Officials, led off the program of this group on Saturday, October 4, following the report of secretary-treasurer A. B. Heagy and the roll call by states.

Dr. Constable reviewed the Association's activities during the past year, observing that much progress has been made in legislation, labeling requirements, and that the group is operating on a sound basis.

However, in looking over the general field, the president noted a number of incidents where economic poisons have been badly treated by

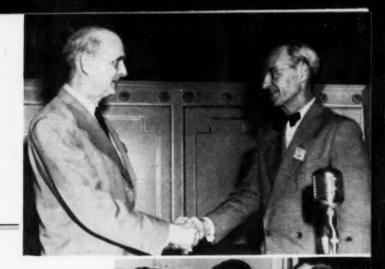
Below: Executive Committee of Association of Economic Poisons Control Officials. Standing, (L to R): Dr. A. B. Heagy, secretary, College Park, Md.; F. H. Gates, Denver, Colo.; E. A. Epps, Baton Rouge, La.: and Clyde Bower, Oklahoma City, Okla. (Seated): Dr. E. W. Constable, retiring president: Dr. Rodney C. Berry, new president: and Floyd Roberts, Bismarck, N. D.

newspapers and magazines in news stories and articles. He quoted a number of headlines from daily papers in his area, pointing out that much of the public actually believes that use of insecticides is at variance with the public welfare.

Some of the headlines, said Dr. Constable, were sufficient to frighten their readers to a serious extent. "DDT May be Poisoning the State" was quoted, and "Doctor Demands Study of DDT" was another.



Dr. E. W. Constable (left) turns over responsibilities of office to his successor, Dr. Rodney C. Berry, new president of the American Association of Economic Poisons Control Officials.



## Officials Meet

"Lindane a Deadly Killer" and "Public Agencies Helpless to Prevent Poisons from Going on Market."

He said that other stories told of death on the farm from the use of various toxicants, leaving the impression that this is almost inevitable with such use. (Actually no reports of injury had involved proper use of pesticides.)

The industry has received a rather bad press, he concluded, stating that the Association can do much to counteract this situation if each member endeavors to correct bad impressions in his own state.

#### Haller Speaks

R. H. L. Haller, assistant chief, Bureau of Entomology and Plant Quarantine, U. S. Department of Agriculture, told the officials that it is highly desirable to have accurate and specific methods of analysis for each pesticide. Most of the newer products are relatively complex synthetic organic compounds, which, unlike the inorganics, depend upon the composition or structure of the molecule as a whole rather than upon a specific element such as arsenic, lead or fluorine.

He divided the newer insecticides into four general groups: chlorinated hydrocarbons, organi phos-(Turn to Page 115) Joseph Noone, National Agricultural Chemicals Association, Washington, D. C.; C. H. Jefferson, Ottawa, Canada; and Henry J. Hoffman, St. Paul, Minn.

Dr. Morton Leonard, Julius Hyman & Co. Division, Shell Chemical Corp., Denver: Dr. Julius Hyman: Mrs. Nicholas Walker and Mr. Walker, Pennsylvania Salt Manufacturing Co., Philadelphia, Pa.

Dr. J. F. Fudge, College Station, Texas; Dr. H. W. Hamilton, secretary, Chemical Specialties Manufacturer Association, New York; and C. L. Weirich, C. B. Dolge Co., Westport Conn.

R. W. Anderson, South Dakota Dept. of Agriculture, Pierre; G. A. Burroughs, associated with John D. Conner, Washington, D. C.; and Mr. Noone.

Dr. H. L. Haller, Assistant Chief, Bureau of Entomology and Plant Quarantine, U. S. Department of Agriculture, Washington, D. C.; E. H. Morgan, Ottawa, Canada; Dr. Berry; and Dr. H. J. Patterson, Salem, Oregon, newly-elected president of American Association of Feed Control Officials.



## Practical Talks; Blast Demonstration Feature

## Fertilizer Safety Conference

EATURING a full program of talks, demonstrations and discussions, the Fertilizer Safety Division, Chemical Section, of the National Safety Council held its second annual meeting at the Sheraton Hotel, Chicago, October 22 and 23. The group elected as general chairman for the coming year, John E. Smith, Spencer Chemical Co., Kansas City, Mo., to succeed J. S. Fields, Phillips Chemical Co., Bartlesville, Okla. Vernon S. Gornto, former secretary, was named vice-chairman and Tom Clarke, GLF Exchange, Ithaca, N. Y., was named secretary to succeed Mr. Gornto.

The following were named to the executive committee: J. J. Hering, Southwest Potash Co., Carlsbad, N. M.; John Mark, Iowa Plant Food Co., Des Moines; Fred Coffee, Wilson & Toomer Co., Jacksonville, Fla.; Dewey Lange, Lange Brothers, St. Louis, Mo.; Lloyd W. Woodiwiss, Thurston Chemical Co., Joplin, Mo.; A. Dale Dunn, Wendell, Idaho; C. J. Watts, Jr., Naco Fertilizer Co., Wilmington, N. C.; E. J. Buehner, Buehner Fertilizer Co., Seymour, Ind.; Adolph F. Ecklund, Saginaw, Mich.; H. V. Lehr, I. P. Thomas Co., Paulsboro, N. J.; Carl Beth,

Below: Head table at luncheon given by American Plant Food Council for Fertilizer Safety Section executive committee. Left to right: W. R. All-stetter, vice-president, National Fertilizer Association, Washington, D. C.; Vernon S. Gornto, Smith-Douglass Co., Norfolk, Va., newly-elected vice-chairman of Section; John E. Smith, Spencer Chemical Co.; Kansas Caty, Mo., newly-elected chairman; Paul T. Truitt, president, American Plant Food Council, who presided at luncheon; Jack S. Fields, Phillips Chemical Co., Bartlesville, Okla.; and Dr. Van Atta, National Safety Council, Chicago.

Smith Agricultural Co., Columbus, Ohio; M. S. Wright, Jr., Texas Farm Products Co., Nacodoches, Texas; and Jack McKenna, Lion Oil Co., El Dorado, Arkansas.

In the opening address of the meeting, Mr. Fields, retiring general chairman, reported on the progress of the group during the past year. He stated that a year ago, only fifteen companies were members of the fertilizer division, but to date, the number exceeds 400. This indicates an unprecedented interest in the safety movement, he observed, and presages increasing progress in this field.

"Management recognizes that it can do something about the fertilizer accident rate in plants of all kinds," he said, and added that if proper leadership is available, something will be done about it. Achieve-



Photos: Top row, Mark Withey describing multiple-blast techniques. Dum-

describing multiple-blast techniques. Dummy represents fertilizer pile; bulbs indicate placement of charges. John E. Smith,
new chairman, Fertilizer Safety Section.
Second row, (L. to R.) John
Kraus, Liberty Mutual Insurance Co.,
Chicago; John Herring, Southwest Potash Co., Carlsbad, N. M.; W. R. Allstetter, vice-president,
Aspr. Washington.

stetter, vice-president, Nat'l. Fertilizer Assn., Washington. Third row: Group of Davison Chemical Corp. personnel attending safety conference.

Fourth row: Mr. Smith; J. S. Fields; J. Lauren Shopen, Consumers co-operative, Kansas City; A. B. Pettit, Davison Chemical Corp., Baltimore, and Paul T. Truitt, president, American Plant

Pood Council.

Below: Mr. Withey chats with

E. A. Burroughs, Jr., F. S. Royster Guano
Co., Norfolk, Va.

ment of safety in fertilizer plants requires the cooperation of all concerned, but the initiative for such a movement must come from the top, he said. That such a trend is the case, is an encouraging fact, it was noted.

The chairman reported that all committees appointed during the past year are functioning satisfactorily, and he expressed appreciation for the good work and helpful attitude shown by those within the industry and many others on the outside.

Because of the illness of J. L. Rosenstein, industrial psychologist and professor, Department of Management, Loyola University, Chicago, Col. Walter B. Brown, U. S. Army (retired) appeared on the program to speak on "What Price Security."

Col. Brown declared that safety is not a narrow endeavor, but rather, it must be the compounded result of national alertness and constant vigilance. He cited the communist menace as being destructive to American ideals, which he said are "nearer the rocks than we ever thought." All that we hold dear is at stake, he reminded, and urged his listeners to take stock as to what enters into a safety program, It is a struggle to keep the nation safe from being undermined. He condemned the "Muscovites," the "Collectivists" and others in our midst, who are working night and day to overthrow our way of life. The free enterprise system is safe only so long as right-thinking citizens have suf-



ficient interest in it to make it work. Industry safety movements are valuable as an important part of the larger concept of national safety, in that cutting down accidents helps to strengthen the country's potential.

#### Proper Blasting Noted

DETAILS of how to achieve the desired effect of leveling a pile of stored fertilizer via a multiple blast technique, were discussed by Mark Withey, Jr., Trojan Powder Co., Arlington Heights, Ill. His talk, an introduction to the blast demonstration scheduled for the following day, presented background information indicating the need for safer methods of reducing a bin of hardened fertilizer material into workable shape without danger of overhangs or of damaging the building from overcharges of dynamite.

"The ideal working face . . . would be one where the face sloped back at an angle closely representing the normal angle of repose," he said. Such ideal conditions can seldom be maintained by single hole blasting, so it is necessary to shake up and displace the working face in a single blast to a greater depth and for the entire height of the pile. This involves a greater mass of material and therefore requires greater energy and of course a heavier charge of explosives.

To attain their effect, holes are drilled not only near the bottom but also higher up in the face and sloping toward the crown of the pile. This requires longer holes of smaller diameter so that the explosive charge may be distributed more uniformly throughout the mass, thus eliminating the highly concentrated charge formerly used. It was the concentrated charges that allowed overhangs and also caused frequent damage to floors, walls and bulkheads in plants.

Use of holes of greater depth permits blasts in better relationship with the amount of material to be blasted. The multiple explosive, set off at a slower rate and distributed over a greater length of the bore hole, produces the desired action safely, even though the charge possesses much greater energy than that formerly used.

Danger of damaging bins and structures is minimized by the delayed-action, multiple charge in which the charges are fired in rapid sequence. Mr. Withey explained that with this system it is possible to arrange the firing sequence of a round of holes, so that the first to fire will offer relief for the second, which in turn relieves the holes fired in the third period, and so on. This method reduces the thrust on walls and minimizes the total vibration.

To illustrate his talk further, a Trojan Powder Co. vibration engineer was called upon to show seismographic charts of how building framework is affected by multiple-blast charges. His report showed that the "A" frame directly over the blasted fertilizer pile received a minimum of shaking and that the same was true when instruments were placed at the base of supporting frames.

In a question-and-answer period, both Mr. Withey and Mr. Jenkins, the vibration engineer, replied to numerous questions from the floor. Some of the queries were concerned with mishres. "Is there any possibility of a misfire in a multiple blast?". Mr. Withey was asked. He replied that if correct procedure is followed to the letter, misfires are extremely unlikely although always possible. Another questioner asked Mr. Jenkins if the seismograph can detect misfires, that is, unexploded cartridges in a broken-down pile of fertilizer. He said that the instrument is not used for this purpose.

Other questions covered the multiple blast as compared to a single blast. Is a delayed-action multiple blast considered a single explosion? Mr. Withey replied, "Yes . . . just 'bang' and that's it." He added that the explosions are much too close together to be separated by the ear. A series of six shots require only 1/20,000th of a second, he said.

If the explosions were set off at a slower rate, what would be the result?, asked another conventioneer. In answer, it was pointed out that the direction of lift would be lost if the explosions were delayed much more than is recommended. "It would be like six single shots," Mr. Withey said, thus losing the advantage of the explosion sequence.

#### Plant Design Stressed

IN a paper on the importance of proper plant design in guarding against fire hazards, G. D. Blair, fire prevention engineer, Ebasco International Corp., New York, told the group that the fertilizer fire situation warrants new designs for the bulk of plants, many of which are constructed of wood and other combustible materials. Although many of the newer plants are fire resistant or open, the older ones for the most part are subject to a 75% fire loss at least, should almost any blaze occur.

In most situations, the plants are located outside city limits where municipal fire protection is unavailable, and first aid fire protection which could be provided easily, is generally inadequate, he observed. Watchman service, also, is usually either non-existent or "unworthy of mention."

Some of the other unfavorable conditions in many fertilizer plants, Mr. Blair told his audience, include open-type electrical devices and heating systems which lend themselves to causing fires.

Such departures from recommended standards create problems vitally affecting company finances and operation, since major factors both in cost and operation are insurance and safety. The unsafe plant will cause high, perhaps prohibitive, insurance rates, he pointed out. The plant may be rejected as uninsurable risk, or be such a poor risk as to preclude an insurance company's writing but a very small portion of the total value. "Complete coverage would be impossible, or accomplished only with difficulty in seeking insurance markets," Mr. Blair said. In addition, he pointed out, substandard properties are less efficient in operation and maintenance and because of the unfavorable impact of poor and unsafe surroundings, poorer personnel attitudes lower-

(Turn to Page 100)

#### Winnipeg, Canada, December host to

## North Central Weed Control Conference

VER 600 scientists from 14 north central states and four western provinces of Canada are expected to participate in the 9th annual North Central Weed Control Conference at the Royal Alexandra Hotel, Winnipeg, December 9 to 11. The program will include reports of results during the past season with agricultural chemicals including 2,4-D, MCP, CMU, 2,4,5-T and others.

Chairman of the conference will be Dr. K. P. Buchholtz, University of Wisconsin College of Agriculture, department of agronomy. H. E. Wood, Weed Commissioner of the Manitoba Department of Agriculture, Winnipeg, is chairman of the conference arrangements.

The opening session will fea-

ture reports on the effects of herbicides on cereal crops with special reference to oats and flax, with discussion led by Dr. P. J. Olson, Plant Science Department, University of Manitoba, and Professor R. S. Dunham of the University of Minnesota. Dr. D. J. Wort, Botany Department, University of British Columbia, will speak on "Physiological Aspects of Micro Nutrient Sprays and Dusts." Dr. P. O. Ripley, Chief, Field Husbandry Department, Canada Department of Agriculture, will provide upto-date information on a subject of wide general interest when he speaks on "2,4-D Dust with Additives of Leaf Feeding Properties.'

The afternoon of the first day will feature a panel on "Persistent

Perennial Weeds," with Dr. W. G. Corns, University of Alberta dealing with "Chemical Control" and Dr. J. M. Smith of the Insect Parasite Laboratory, Belleville, Ontario, speaking on "Biological Control of Weeds." Special consideration will be given to the wild oat problem in the conference area. Recent "Taxonomic Investigations of the Wild Oat" will be reported by D. R. Lindsay of the Botany Division, Ottawa. Cultural and chemical control will be dealt with by D. A. Brown and H. W. Leggett of two Canadian Experimental Stations. Dr. E. A. Helgeson, North Dakota State College, Botany Department, will report on "Wild Oat Control in the U.S.A." The program for the first day will close with "



In the Photos

Left: Dr. K. P. Buchholtz, University of Wisconsin, chairman of the Conference at Winnipeg.

Right: Dr. C. J. Willard, Ohio State University, who will act as chairman of morning session.



NOVEMBER, 1952



Left: Royal Alexandra Hotel, Winnipeg, Man., scene of the 9th annual North Central Weed Control Conference. Over 600 scientists are expected to be on hand for the meeting in December.

an evening session on "Basic Studies" under the chairmanship of Dr. W. E. Loomis of the Iowa State College Botany Department.

The morning session of the second day under the chairmanship of Dr. L. M. Stahler of Pacific Coast Borax Company will be devoted to a discussion of "Recent Trends in the Application of Herbicides." Several prominent speakers from government and commercial organizations will report on recent advances in the use of ground, aerial and railway application equipment.

#### Sectional Meetings

FOR the afternoon session the conference will break up into four meetings:

Industry — under the chairmanship of Dr. K. Barrons of Dow Chemical Company, Midland, Mich.

Brush Control—under Dr. E. P. Sylwester, Botany Department, Iowa State College, Ames, Iowa.

Horticulture—under Dr. L. G. Holm, Horticulture Department, University of Wisconsin, Madison.

Extension and Regulatory under Professor Ralph Crim, University of Minnesota, St. Paul.

Although the program details for all of the sectional meetings have not been completed, this portion of the conference is expected to warrant special attention from all who are interested in these particular phases.

The Canadian chemical companies will be hosts to the delegates at a reception, followed by the official banquet. Mr. Justice S. Freedman, will be banquet speaker on the subject "Canada—an American Nation in the Commonwealth."

On the final day Dr. C. J. Willard, Ohio State University Agronomy Department will be chairman of the morning session. Dr. A. H. Larson of the University of Minnesota will speak on "Some New Weed Problems of the North-Central Area," while Dr. L. Derschied of South Dakota State College Agronomy Department, will discuss a "Bal-

anced Weed Control Program." The conference will close with reports on "Problems in Registration of Herbicides," "The Present Status of Chemicals" and conference committee reports.

According to estimates by H. E. Wood, the Weed Conference will shatter previous records in both attendance and interest. Nearly two months before the conference, he reported, over 400 delegates had made reservations and 34 industrial companies had arranged to display new chemicals and equipment at the conference.

Local committees are making special plans for the entertainment of visiting ladies in connection with the conference.

Canadian locale of North Central Weed Conference lends international aspect to 9th annual meeting scheduled for December 9-11. Reports of past season's results with many herbicides to be heard. Speakers represent both U. S. and Canadian firms.

#### Suppliers' Bulletins

#### **Bag Information Given**

Information needed to specify the proper multiwall bag for any of a wide variety of products is covered in a new brochure produced by the Bagpak Division, International Paper Company.

Each of the five basic types of multiwall bags—sewn open mouth, sewn valve, pasted open mouth, pasted valve, and automatic or self-opening sack—are illustrated in detail. Dimensional specifications are shown, and a discussion of the construction of the bag and of the available methods of filling and closing accompany each illustration.

Other subjects covered by the new Bagpak brochure include bag kraft paper, bag printing, palletizing and bundling, the cushion stitch closure, and various types of bagfilling and closing machines.

Copies of Brochure No. B1 may be obtained by writing to the Bagpak Division, International Paper Company, 220 East 42nd Street, New York 17, N. Y.

#### New Dust Filter Bulletin

A new illustrated dust filter bulletin (No. 528) dealing with all the aspects of dust control as achieved by the Hersey-type dust filter has been released by The Day Company, of Minneapolis, manufacturers of the "AC" Dust Filter.

The bulletin presents a practical approach to dust control problems and stresses the advantages of Day "AC" Filters with a continuous-automatic method of cleaning the filter cloth.

Other information is also set forth in the bulletin by charts, diagrams and copy. This includes: filtering efficiencies as high as 99.998%; ability to reclaim materials, and separate dust from two or more exhaust streams within the same filter; adaptability for many types of applications; space saving features and ease of installation.

For a copy of Bulletin No. 528, write The Day Company, 817 3rd Ave. N. E., Minneapolis 13, Minn.

#### Marking Equipment Catalog

Industrial Marking Equipment Co., 454 Baltic St., Brooklyn, has recently issued a catalog of industrial marking equipment, copies of which are available without charge to readers of AGRICULTURAL CHEM-ICALS. Illustrated and described are a conveyor line marker, a carton marker, a multi-wall bag printer and a corrugated and fibre shipping case printer. The conveyor line marker automatically dates, codes or marks production runs of cartons and other packages. The autoprinter for cartons, multi-wall bags, etc., prints any or all surfaces of the container with address, export information, supplementary markings, etc. It is capable of handling containers at the rate of 2,400 impressions per hour.

#### DuPont Safety Bulletin

The story of safety promotion in the plants of E. I. duPont de Nemours & Co., Inc. is told in a booklet just put out by the company. Featuring a cover of high-visibility yellow and black "dazzle" striping of the type used in hazardous places in chemical plants, the 32-page booklet contains an exceptionally complete, well illustrated story of safety, showing pictures and drawings of latest devices such as goggles, masks and respirators, hats, shoes, gloves, and protective clothing all of which are pictured.

In its foreword, the magazine points out that "Industrial safety in America has advanced steadily over the past fifty years. Accident-prevention is so much a part of industrial operation today that the duPont employee is more than four times as likely to be injured off-the-job as on; even when handling high explosives or dangerous chemicals, he is safer

at work than at home . . . Safety onthe-job has come because industry well recognizes that in improved morale, increased efficiency and enlarged productivity, it pays attractive dividends."

#### Offer Copper Fungicides

Barfair Laboratories, City Island, New York 64, N. Y., are introducing a new group of solvent soluble, copper based organic fungicides which are now available for industrial testing. One member of the new line,"Barfair CAA" is a water dispersible copper acetate which it is believed may have possibilities as a cheap, agricultural fungicide. Barfair Laboratories have previously been known for their product "Barfair 77," a product widely used in the yachting field as a mildewproofer for vacht sails. The new line marks their entry into the field of heavy duty, copper based, industrial fungicides.

#### Technical Data Available

Wallach-Gracer Export Corporation, New York, has prepared a series of pamphlets describing the agricultural and industrial chemicals it supplies. Acting as agents for Velsicol Corp., Diamond Alkali Co.; U. S. Industrial Chemicals, Inc.; Sharples Chemical Co.; Woolfolk Chemical Works; F. W. Berk Company; Petrochemicals Co., Ltd., London, England; and "A.P.E.," a division of the Edison Company of Italy, the firm has bulletins covering the following agricultural chemicals:

Aldrin, dieldrin, ANTU, ammonium sulfate, BHC, technical chlordane, 2,4-D and its formulations, DDT, ethylene dibromide, methionine, parathion and its formulations, pentachlorophenate, pentachlorophenol, phenyl mercuric acetate, sodium trichloroacetate, toxaphene, technical urea (fertilizer grade), and warfarin.

The Italian company (A.P.E.) manufactures a triple superphosphate fertilizer, 42-45%, which Wallach-Gracer offers in the U. S., Canada, Cuba, Hawaii, Formosa, the Philippine Islands and South Korea. Bulletins are available from Wallach-Gracer, 55 W. 42nd St., New York 18.



on next year's insects and weeds



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2.4-D ACID and ESTERS 2,4,5-T ACID and ESTERS MCP ACID (2-Methyl-4-Chlorophenoxyacetic Acid) SANTOBRITE\* (Sodium Pentachlorophenate, Tech.) SANTOPHEN\* 20 (Pentachlorophenol, Tech.) IPC 3-CHLORO-IPC

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#### **Technical Briefs**

#### **Boron Content is Studied**

Mid-terminal leaves, collected in summer from boron-deficient trees contained 8-18 P.P.M. boron (B), dry weight basis. Leaves from comparable trees that had received 6 annual narrow-ring soil applications of borax or H<sub>3</sub>BO<sub>3</sub> contained 29-37 P.P.M. Mature fruits from these untreated trees contained 45 P.P.M.: fruits from treated trees 13-31 P.P.M. Leaves from trees that had received excessive B applications, causing chlorosis, contained up to 200 P.P.M. In 5 Hudson Valley orchards that showed internal cork of fruits in the dry year, 1949, but not since, leaves from untreated McIntosh or Cortland trees contained 14-26 P.P.M. in mid-summer 1950, and 18-28 P.P.M. in 1951, B application to the soil in either fall, 1949, or spring, 1950, caused a small and an similar increase in leaf-B. Orax in 2 sprays caused a greater first-year increase but the residual effect was less. Less B was absorbed when broadcast than when restricted to a ring beneath the branches. These differences were more striking in mature fruits than in leaves. Increasing levels of nitrogen fertilization produced corresponding decreases in leaf-B concentration. Among fruit tissues, the endocarp had the highest B concentration, the skin, the fleshy ovary, and the seeds somewhat less, and the floral tube, the least.

Summary of "Boron Content of Melntosh Apple Leaves and Fruits in Relation to Symptoms and Methods of Application," by A. B. Burrell, Damon Boynton and A. D. Crowe, befor American Chemical Society, Atlantic City, N. J., Sept., 1952

#### **Fungicides Control Rust**

Certain napthoquinones and phenols have shown fungicidal value at low concentrations in the control of stem rust of cereals. Urediospore germination of Puccinia graminis tritici was prevented at concentrations as low as 2 p.p.m. Spray applications prior to infection using the fungicides with spreader and stabilizer resulted in 90 to 100 per cent rust control at

low concentrations for several compounds studied. Spray applications 2 days after inoculating seedlings with urediospores in the greenhouse at 20°C. showed no reduction in subsequent uredial development with the phenols and only small reductions with the naphthoquinones used. Ethyl alcohol solutions of technical 2, 3-dichloro-1, 4-naphthoquinone (Phygon) with a stabilizer appeared to be the most economical compound presently available.

Summary of "Stem Rust Control with Fungicides," by J. G. Dickson, G. R. Grimm and A. L. Hooker, before American Chemical Society, Atlantic City, N. J., Sept., 1952

#### Fertilizers & Vegetables

The effects of major and minor fertilizer elements on yield and carotene and starch content of sweetpotatoes were investigated, and the following conclusions were drawn:

 Excessive quantities of nitrogen decreased sweetpotato yields. The use of 82 pounds of N per acre was the highest rate needed in the four experiments.

2. The use of phosphorus fertilizers with rates of applications as high as 200 pounds of PsO<sub>2</sub> per acre had no effect on yields. With the use of 300 pounds PsO<sub>2</sub> per acre, a yield increase was obtained only on the Lares clay at Corozal.

3. No consistent increases in yields were obtained with increasing potassium additions to the soil. There was a yield response to the potassium applications on the Catano loamy sand of the Loiza I experiment. There was no significant response to potassium on Lares clay at Corozal, on Catano loamy sand at the Loiza II experiment, or on the Sabana Seca sandy clay loam at Sabana Seca.

4. The yields of marketable sweetpotatoes were increased by the use of potassium on Catano loamy sand at the Loiza I experiment.

 Filter-press cake used alone gave low yields on Catano loamy sand.
 The use of filter-press cake plus fertilizer gave good results both on the heavy Lares clay and on the Catano loamy sand.

5. The yields of sweetpotatoes were measurably affected by the use of lime in the acid Lares clay. The application of lime to raise the pH gave increased yields with increased soil pH. The Sabana Seca experiment showed yield increases from the use of calcium sulfate (gypsum).

No consistent yield increases were obtained from the use of magnesium oxide.

8. The use of boron gave significant yield increases in the Sabana Seca and Corozal experiments, but not in the Loiza experiment.

9. No yield increases occurred with the use of manganese and copper.

 There was no effect on starch content attributable to any major- or minor-element treatment.

11. The use of nitrogenous fertilizers influenced the carotene content of the sweetpotatoes; where nitrogen applications produced yield increases there were also increases in the carotene content.

 Increases in carotene content were obtained with phosphorus only when the yields were significantly increased by addition of phosphorus.

13. No significant effect on carotene content was noted for potassium, except for a decrease in one experiment on a Catano loamy sand.

14. The carotene content of sweetpotatoes was measurably affected by
the use of calcium carbonate on acid
soils (pH 4.5). Increases in pH were
accompanied by increases in carotene
content. In most cases where yields
were increased by liming, the carotene
content increased appreciably.

15. No responses were obtained from the use of boron, magnesium, copper, and manganese on the carotene content of sweetpotatoes. No effects were obtained on yields by use of these elements, except boron on a Sabana Seca sandy clay.

16. A recommendation is made for sweetpotatoes of 600 pounds of a 8-6-16 formula per acre.

17. The yields of sweetpotatoes compared favorably with yields for the leading sweetpotato producing States of Louisiana and N. Carolina.

18. Yields were increased by plant-

ing in the shorter days of winter as compared to the longer summer days. Carotene content, however, was increased with spring as compared to winter plantings.

The effect of Fertilizers on the Yield and Quality of Sweetpotatom, by Fablo Landrau, Jr. and George Samuela, in Journal of Agriculture of University of Fuerto Rico, Vol. XXXV. No. 2.

#### D-D vs Golden Nematode

The viable golden nematode population of a heavily infested field plot was decreased 99 per cent by fall application of 450 lbs. per acre of D-D mixture to a depth of 4 inches on 10-in. centers by a hand applicator. The number of living golden nematodes was kept at a low level for 4 years by yearly D-D applications, although potatoes were grown each year. Viability was determined by examination of larvae under a microscope and by determining the number of new individuals developing on potato roots. In soil samples taken after treatment the number of cysts containing living larvae per 2 oz. of soil for the 4 successive years were: .08, .33, 0, and 0. A few immature females were present on potato roots each year. In each of the 4 years yields of Green Mountain, a late maturing variety, and Cobbler, an early maturing variety, were significantly higher on soil treated with D-D than on untreated soil.

Summary of "Yearly D-D Treatments and Continuous Potato Production in Relation to the Golden Nematode Population of the Soil," by W. F. Mai and Bert Lear.

#### Study Control of Foxtail

Petri dish tests revealed that the germination of giant foxtail seeds seldom exceeded 20 to 34 per cent. Scarification of the seeds decreased rather than increased germination. Germination was increased by culturing in association with soil, by treatment with potassium nitrate and sodium thiocyanate solutions, and by alternating temperatures (21° to 37° C.) and moist storage at 21° C. The presence of germination inhibitors in the seeds was indicated by means of filter paper absorption experiments. In compact soil giant foxtail seed germinated and emerged when planted

no more deeply than 3 cm. while in looser well-aerated soil, they emerged from a depth of 12 cm. Alternate wetting and drying of the soil also stimulated further germination of seeds planted at several depths. It is suggested that the alternate wetting and drying process results in the partial removal, at least, of germination inhibiting substances from the seeds.

Chemical soil treatment studies with the triethanolamine salt of 2,4-D. Crag Herbicide 1. dichloral urea. and CMU disclosed that each of these is effective in controlling the germination or seedling development of giant foxtail at several of the rates tested. It was suggested that Crag Herbicide I be used to control this weed in corn any time following emergence, up to and including lay-by and that dichloral urea applied at 5 lb. per acre might also be employed in well established corn plantings. Chloro-IPC and CMU were both quite effective, the latter checking seedling growth at rates as low as 2.5 lb. per acre. Alternate wetting and drying of this chemical soil treatment series disclosed that the chemicals did not prevent the dormant seed from germinating after normal cultural conditions were restored. In the CMU series, however, the seedlings did not survive, indicating residual action of the chemical.

—Summary of "Germination and Chemical Control of the Giant Foxtail Grass," by Lawrence J. King, in Contributions from Boyce Thompson Institute, Vol. 16, No. 11, 1952.

#### Systemics on Vegetables

Field experiments were conducted during the 1951 season in which schradan and "Systox," applied as foliage sprays, were compared with each other and with other organic insecticides in the control of certain vegetable pests. "Systox" was found to give good initial kill of the potato leafhopper, empoasca fabae Harris, in concentrations as low as .25 pints per 100 gallons. Schradan proved ineffective against this insect. Both schradan and "Systox" gave good control of the two-spotted mite, Tetranychus bima-

culatus Harvey, and all aphid species encountered, namely Phopalosiphum pseudobrassicae (Davis), Myzus persicae (Sulz.), and Illinoia solanifolii (Ashm.). Residual action of both systemics is dependent upon the amount of active ingredient applied to the plant. In vigorously growing turnips, "Systox" gave better initial aphid kill in low concentration than schradan whereas schradan gave longer residual action for all concentrations tested. "Systox," however, gave better residual action in mature eggplants when comparable amounts of schradan and "Systox" were used. Residue analyses of various vegetable samples have shown conflicting results and no general comparisons can be made between schradan and "Systox."

—Summary of "Systemic Poisons on Vegetable Crops," by Alfred C. Dowdy and J. P. Sleesman, Ohio Agricultural Experiment Station, Wooster, Ohio, in Journal of Economic Entomology, Vol. 45, No. 4, August, 1952.

#### Low Volume Sprays

The low-volume sprayer is tractor-mounted and consists essentially of the pump operated by the tractor power take-off or by a belt and pulleys from the power take-off or pulley shaft, the connecting hose, spray tank, boom, drop pipes, and nozzles. Several different kinds of pumps are available for this type of sprayer. A rotary gear pump has been used exclusively for experimental work and has proved satisfactory. A clean 55 gallon drum mounted on a frame on the rear of the tractor provides a satisfsactory spray tank. The boom can be constructed of either galvanized iron pipe or copper tubing. The latter is less likely to cause trouble through corrosion and nozzle clogging. In order to obtain uniform insecticide coverage of the plant, some type of drop pipe is necessary for spraying most crops. A piece of 1/4-inch copper tube, in which a short piece of stiff rubber hose is inserted to prevent breakage, provides a satisfactory drop pipe. The use of a double swivel connector on the drop pipe aids greatly in adjusting the angle of the nozzle. This enables a more complete coverage of the plants.

> Nozzles which produce a flat, (Turn to Page 111)

#### The Listening Post

This department, which reviews current plant disease and insect control problems, is a regular monthly feature of AGRICULTURAL CHEMICALS. The comments on current plant disease problems are based on observations submitted by collaborators of the Plant Disease Survey Bureau of Plant Industry, Soils, and Agricultural Engineering, U. S. Department of Agriculture, Beltsville, Md.



The tung-nut meal used in tests 1, 2, and 3 was purchased on the open market in December 1949. Subsequently, this was considered a possible source of error, since M. W. Emmel at the Florida Agricultural Experiment Station had shown that the toxicity of tung-nut meal to chicks decreased with the age of the meal. Accordingly, meal milled in May, 1950 was compared with the old meal in tests 4, 5, and 6. The new

#### By Paul R. Miller

LAIMS that control of rootknot nematode (Meloidogyne spp.·) can be obtained in the South by use of tung-nut meal as a fertilizer, have been made by nursezymen for a number of years, according to a report from D. L. Gill, U.S.D.A., Bureau of Plant Industry, Soils and Agricultural Engineering.

To determine whether such claims are well based, six tests were conducted. In the last three of these tests, parathion, as "Vapophos," a proprietary material containing 15% parathion, was included since parathion had been shown to reduce root-knot nematode infestation.

A sandy woods soil was used in all tests, in No. 10 cans. The amount of the tung-nut meal or the parathion to be used was calculated on the basis of the surface area of soil in the can. Amounts of tung-nut meal varied from 0 to 5000 pounds per acre. Parathion was used at the ates of 200, 400, and 600 pounds of 15% material per acre. The soil for the several cans receiving each treatment was poured together and mixed thoroughly with the meal, or parathion. Nematode inoculum was obtained by grinding in a food chopper heavily knotted gardenia roots collected near Spring Hill, Alabama. The quantity of inoculum needed for a test was stirred thoroughly after being ground, and then mixed with the soil at the rate of one tablespoonful per can. Planting was made immediately afterward. The roots of each plant were scored for root-knot galls and the relative root-knot index of each treatment was calculated.

Table 1

Relative root-knot nematode index of plants grown in artificially infested sandy woods soil and treated with tung-nut meal or parathion

		R	pot-knot ind	ex		
Treatment (lbs. per acre)	Tomato test 1	Gardenia test 2	Gardenia test 3	Tomulo test 4	Squash test 5	Gardenia test 6
Untreated	87	84	100	80	98	53
Tung-nut meal						
Old (1000 lbs.)	76			58	91	47
New (1000 lbs.)				56	93	60
Old (1500 lbs.)	86			91		
New (1500 lbs.)				72		
Old (2000 lbs.)	74	73	94	60	91	50
New (2000 lbs.)				99	94	37
Old (2500 lbs.)	61	73	100	50	92	42
New (2500 lbs.)				75	93	43
Old (3000 lbs.)	35	83	100	96	98	50
New (3000 lbs.)				88	97	50
Old (3500 lbs.)		73	100	70	82	52
New (3500 lbs.)				44	94	37
Old (4000 lbs.)		76	100	100	88	45
New (4000 lbs.)				72	88	40
Old (5000 lbs.)					91	41
New (5000 lbs.)					89	38
Old (2500 lbs.) acid-treated)				75	89	40
New (2500 lbs., acid-treated)				83	96	50
Old (3000 lbs., acid-treated)				95	95	50
New (3000 lbs.) acid-treated)				63	94	40
Old (2500 lbs., leached)				69		
New (2500 lbs., leached)				95		
Old (3000 lbs., leached)				64	85	29
New (3000 lbs., leached)				85	97	48
Parathion (200 lbs.)				3.8	25	20
(400 lbs.)				6	14	8
(600 lbs.)					12	9

A Lowest index = least root-knot.

b "Vapophos," 18% wettable parathion.



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meal was not ground until needed for use.

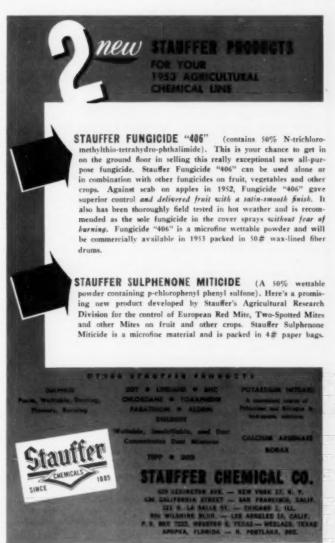
Emmel had also demonstrated that saponin and an unnamed toxic agent are present in tung-nut meal. In these tests saponin was removed by two methods used by him. In one, one liter of meal was moistened with 600 milliliters of 5% aqueous solution of hydrochloric acid; after standing for 30 minutes it was heated for 30 minutes in a pressure cooker at 15 pound's pressure. In the other, the meal was tied in a sack made of six layers of cheesecloth and suspended in running water for 24 hours.

In the first test, 10 cans were tomato seedlings (variety Pritchard) used for each treatment; and three were transplanted to each can December 22, 1949. Plants dying within the first few days were replaced. The plants were grown in a greenhouse, unheated unless freezing weather was forecast. The plants were removed March 29 and rated as to root-knot index. These ratings, together with the amount of tung-nut meal applied, are shown in Table 1. There was some indication of control at 2500 and 3000 pounds per acre. The plants grown with the highest rate of treatment were stunted

In a second test, 16 cans were used for each treatment and three rooted cuttings of Gardenia jasminoides (variety Veitchi) were transplanted to each can April 13, 1950. These were removed June 14. Rootknot ratings and treatments are shown in the table. No practical value of tung-nut meal was evident. For the third test, these gardenia plants were put back in infested soil containing the same amount of meal as they were grown with previously since some growers had stated that rootknot infection of transplanted plants becomes less severe in treated soils. These plants were removed November 7 and, as shown in the table, infection was heavy regardless of treatments.

In the fourth test, old and new lots of tung-nut meal, untreated, leached, or acid-treated, were compared with parathion. Ten cans were used for each treatment and three tomato plants (variety Pritchard) were transplanted to each can June 9, 1950. These were removed and rated August 3. The ratings (table 1) show no consistent beneficial effect of the tung-nut meal upon root-knot infection, but parathion reduced it.

Because of the relatively poor survival of plants in test 4, two other similar tests were conducted. In test 5, 10 cans were used for each treatment and five yellow crookneck squash seed were planted in each can August 8, 1950. The resulting plants were thinned to three. These were removed and rated September 7. The results (Table 1) show no practical benefit from tung-nut meal, but parathion reduced root-knot infection. The mean height of the squash plants grown in soil containing the new meal was significantly less than the mean height of the plants grown in soil with an equal amount of the old meal. This



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Order direct from Agricultural Chemicals 175 Fifth Ave. New York 10, N. Y. retardation did not occur in plants grown in soil in which the acid or water-treated meal was used, suggesting that saponin was the agent retarding growth.

When the soil was prepared for the fifth test, an equal quantity was mixed for the sixth test. Three rooted cuttings of Gardenia jasminoides received under the variety name Florida were transplanted to each can August 8, 1950. These were removed and rated June 6, 1951. The root-knot ratings (Table) show that there was less root knot present than in other tests, but there was no benefit from the tung-nut meal. Parathion (Turn to Page 113)

Table II

Summarization of the index data on spray additives trials for control of sweet corn leaf blight, Florida, 1951.

Treatment	1	1 (check)		P. E. P. S.			Triton B 1956			duPont Spreader-Sticker		
Replicate	Α	В	C	A	В	C	A	В	C	A	В	C
1	3	90,0	10	3	87.5	10	3	87.0	9	3	90.5	10
2	3	85.0	10	3	87.5	9	3	83.0	9	3	81.0	8
3	2	81.5	9	3	86.0	8	3	86.0	9	2	91.0	7
4	3	85.0	8	3	91.5	10	2	87.0	9	2	82.0	10
Totals	11	341.5	37	12	352.5	37	11	343.0	36	10	344.5	35
Average	2.75	85.4	9.25	3.	88.1	9.25	2.79	85,8	9	2.	86.1	8.8

A = Intensity index rating: 2 = light, 3 = moderate infection, in scale from 0.5 (very light) to 5 (very heavy).

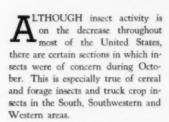
B = Yield per block in pounds of unhusked marketable ears.

C = Fill index: 1 being no fill, 10 being complete fill of ears.

#### Insect Pest Reports From Many U. S. Points

This column, reviewing current insect control programs, is a regular feature of AGRICULTURAL CHEMICALS. Mr. Dorward is connected with the department of Insect Pest Survey and Information, Agricultural Research Administration, Bureau of Entomology and Plant Quarantine, U. S. Department of Agriculture, Washington. His observations are based on latest reports from collaborators in the U.S.D.A.'s pest surveys throughout the United States.

#### By Kelvin Dorward



#### Cereal and Forage Insects

HE corn earworm was active in widespread sections of the United States during the month. In Oregon, there was 40-50 percent infestation of cannery corn but the loss was small. The infestation was heavier than average but not as bad as that of 1951. Damage was generally severe in Millard and Emery Counties, Utah except in a few cases where control was practiced effectively. Garden sweet corn carried a higher population of this insect in the Fargo, North Dakota region than had been present for the past seven years. In Kansas, field corn was heavily dam-



aged and moths were exceptionally abundant. During early October, there were severe infestations of late sweet corn throughout the State of Ohio.

The fall armyworm was rather general throughout the South during October. Until a freeze occurred in Kansas, fall-sown wheat in Greeley County was damaged by this insect. Earlier in the month there was movement from volunteer wheat to newlyseeded wheat in Grant County, Kansas. Damage, however, was not extensive. In Texas, the insect was very abundant and destructive in cane fields and pastures near Weslaco. Injurious infestations were found in small corn in the Lower Rio Grande Valley of Texas. August-planted oats, wheat and rye in the southern half of Louisiana were generally infested and in some localized areas the damage was severe. Severe injury was caused to isolated plantings of alfalfa in Montgomery County, Tennessee.

The fall armyworm also caused heavy damage to lawns and pastures in Jones County, Mississippi and to pastures in Jackson County. Other Mississippi counties reporting damage included Oktibbeha and George. During last September, pastures and lawns were heavily damaged in Fayette, Monroe and Spalding Counties, Georgia. Widespread damage to pastures, soybeans, and cotton occurred in Peach County, and foliage was stripped from grasses and crimson clover in Jasper County. The insect was responsible for heavy damage to fescu, clover, crabgrass, millet and turnips in Morgan County and to pasture grass in White County. Sugarcane was defoliated by the worm in Ben Hill County. Infestations were also reported from Florida where St. Augustine, Bermuda, and carpet grass pastures and St. Augustine lawns in the Bradenton area were involved.

The first fall reports of the greenbug on wheat were received during October. Greenbug colonies on fall-seeded wheat were reported from Riley, Marshall, Republic, Atchison, Brown, Jackson, Nemaha, and Pottawatomie Counties, Kansas. The majority of the insects were in the young instars, but one winged form was found in Riley County and one in Pottawatomie County. The first greenbug report for Oklahoma came from Kay County.

(Turn to Page 99)

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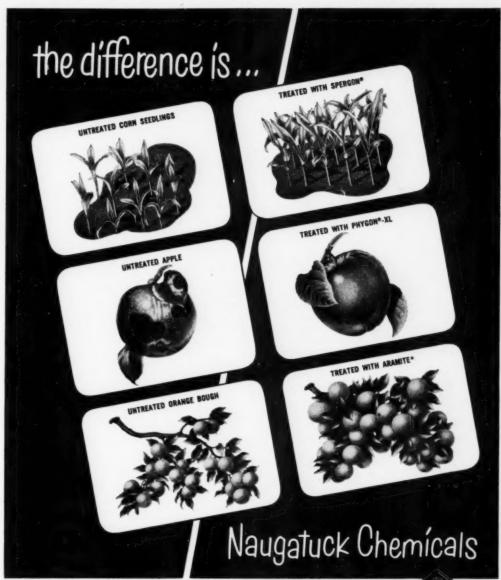


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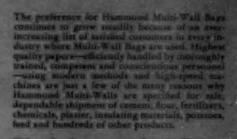
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♠ Joseph T. and Benjamin L. Seem, operating the Seem Seed Co. at Zionsville, Pa., are thoroughly sold on the performance of Ammonium Sulphate, both in high-nitrogen complete fertilizers and as a supplementary nitrogen material for direct application.

In their hybrid seed corn operations, the Seem Brothers plow down 700 to 800 lbs. of a 10-10-10 or its equivalent to improve the nutrient level of the soil. At planting time, they add an application of 100-150 pounds of 10-10-10 in the rows. When the crop is well along, the Seem Brothers now also side dress with 300-500 pounds of Ammonium Sulphate as a direct application.

This scientific fertilization program with Ammonium Sulphate has increased the average seed corn yield from a previous 60 bushels per acre to 100 bushels. In addition, test weights are higher and seed quality is excellent.

The Seem Brothers report equally good results from the use of Ammonium Sulphate on seed wheat and barley. From an investment standpoint, the return from the increased yield is many times over the fertilizer cost.



BENJAMIN L. SEEM

JOSEPH T. SEEM

# Bigger yields for farmers mean better business for you

As more and more farmers turn to U·S·S
 Ammonium Sulphate—in high-nitrogen fertilizers and for direct application—to increase both the quantity and quality of their crops, demand goes up and up.

Be ready to meet this demand by using U·S·S Ammonium Sulphate to supply a major part of the nitrogen content in your highnitrogen complete fertilizers. And supplement your line by selling U·S·S Ammonium Sulphate in 100-pound bags for direct application.

For complete information on U·S·S Ammonium Sulphate, contact our nearest sales office or write directly to United States Steel Company, 525 William Penn Place, Pittsburgh 30, Pa.

U·S·S AMMONIUM SULPHATE



. . . . .

UNITED STATES STEEL

# CUSTOMERS H-C (HIGH- COTTON

# BEMIS DRESS PRINT AND WHITE COTTON

Albert A. Green, President of Jackson Fertilizer Co., Jackson Miss., says:

"We have been highly pleased this year with the pretty white high-count sheeting bags you have supplied us. Our customers like them very much and they were delighted to have these bags with the band-labels that are easy to remove.

We were also pleased with the strength of these high-count sheeting bags as we have had very little trouble with torn bags."

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T. W. Allen, President of Sand Mountain Fertilizer Company, of Attalla, Alabama, says:

"Any manufacturer would be mighty happy to get the percentage of gain we got. Customers don't mind the slight premium price, because the same high-count cotton fabric would cost them several times as much at the neighborhood store."

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E. T. Spidle, General Manager of the Capital Fertilizer Company, Montgomery, Alabama, says:

"These bags proved to be very satisfactory and we expect to use them again next season."

Ask your Bemis Man for the whole story about Bemis H-C Dress Print Bags

# LIKE BEMIS FERTILIZER BAGS

# SHEETING BAGS BUILD FERTILIZER SALES!

**Bemis Dress Print** Fertilizer Bags Provide Garments for the **Entire** Family!



Mr. Dallas Greer, who uses Mountain Brand Fertilizer on his farm, poses with his wife and daughter...all three are wearing garments made from Bemis H-C print patterns. Pleased customers like the Greers help get still more customers for Mountain Brand.

The experience reported by Mr. T. W. Allen, president of the Sand Mountain Fertilizer Company, of Attalla, Alabama, is typical. He gave a trial-size order for Bemis H-C Dress Print Bags for the well-known Mountain Brand Fertilizer. Sales results were so good that within three weeks he placed three more orders . . . all very large ones.

Now, Mr. Allen says, "Any manufacturer would be mighty happy to get the percentage of gain we got. Customers don't mind the slight premium price, because the same high-count cotton fabric would cost them several times as much at the neighborhood store. And those New York-designed Bemis prints certainly please the women."

Bemis



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# PROTECTION



WPPL TEXTILE

Call on Fulton too, for Polyethylene and Pliofilm Bags, and for Polyethylene Barrel Liner Tough—like an alligator's hide! Fulton's W.P.P.L. (Waterproof Paper Lined) Bags protect your product against the detrimental effects of moisture and odors—an economical, easy-to-handle textile bag built to do the job of a more costly rigid container. Your product is fully protected with an inner lining of plastic or crinkled Kraft paper laminated with special adhesives to either cotton or burlap which safely, surely seals in your product . . . nothing gets in—or out! For full details, write your nearest Fulton factory today!

Fulton BAG & COTTON MILLS

Atlanta
St. Louis
Dullius
Kansas City, Kans.
Los Angelos
Minneapolis
New York City
Denver
New Orleans

# INDUSTRY NEWS

#### Calspray Names Geo. Wood

George Wood has been appointed district manager of California Spray-Chemical Corporation's San



GEORGE WOOD

Joaquin Valley district. This area covers the counies of Kern, Fresno, Inyo, Kings, Madera, Merced, Tulare and Stanislaus in California.

According to Arthur W. Mohr, Calspray president, Mr. Wood, who joined the firm in 1947, was formerly branch manager at Yuba City, and earlier was an instructor in the U. S. Army Malaria Control School in Panama under Dr. W. W. Middlekauf. He holds degrees from both Stanford University and the University of California. He has had wide experience in helping control both insect pests and plant diseases of crops grown in his territory.

#### Pac. Guano Ups Bloxham

Weller Noble, president and general manager of the Pacific Guano Company, has named George P. Bloxham manager of the company's Southern Division, succeeding Howard G. Conley.

Mr. Conley for the past five years manager of the Southern Division, has been named assistant general manager of Pacific Guano with headquarters in the company's Berkeley office. Athough Mr. Bloxham has been with the company less than a year, he is well known in the trade on the Coast, having spent more than 25 years in an executive capacity with two other leading fertilizer concerns.

#### Hartley to Remsen Co.

Appointment of Richard G. Hartley as sales manager, has been announced by the Remsen Chemical Co., Oceanside, N. Y. Mr. Hartley was formerly associated with W. A. Cleary Corp., New Brunswick, N. J. The Remsen company manufactures insecticides and rodenticides.

#### Ins. Conference at Rutgers

Rutgers University, New Brunswick, N. J., has announced that its annual conference of insecticide, fungicide and herbicide dealers will be held at New Brunswick, November 17. Dr. Ordway Starnes, extension specialist in entomology, is in charge of a program designed to inform dealers on the latest developments in these three fields and the latest control recommendations. Sessions will be held in the University Commons.

#### Gypsy Moth Quarantine

A public hearing was to be held October 30th at the Connecticut Agricultural Experiment Station, New Haven, Conn., on a proposal to revise the gypsy moth quarantine law for Connecticut. The proposed revision would enlarge both the generally infested quarantined area and the suppressive quarantined area. The proposed revision coincides with a newly revised federal quarantine.

#### Klauss-White Moves.

Klauss-White formerly at 122 Woodhull Dr., plans to move early in November to new quarters at 1441 W. Poplar St., San Antonio, Texas. Their expanding insecticide business made necessary the move to new and larger quarters.

#### To Open 3 Plants in Maine

Formation of the Northeastern Chemical Corporation, with headquarters at Portland, Maine, has



JOSEPH McKENNA

been announced by the W. H. Hinman Industries. Three new plants, two at Portland and one at Westbrook, Maine, are under construction at the present time, with actual operations expected to get under way in March, 1953. The plants will manufacture insecticides, fungicides and herbicides and will market them through regular trade channels. The company will not engage in retail business. Production will include both liquid and dust based concentrates.

General manager of the new company will be Joseph McKenna, formerly in charge of insecticide production for F. H. Vahlsing, Inc., with plants in Robbinsville, N. J., Corpus Christi, Texas and in Mexico. Mr. McKenna has taken responsibility for purchasing bag filling equipment, blenders, grinding machines and other equipment in connection with the construction of the three plants.

Mr. McKenna said that the new facilities will provide a source of supply close to the New England area, which was not available heretofore.

#### Opens New Atlanta Plant

John Powell & Co., Inc., New York, has announced the establishment of new insecticide manufactur-



VINCENT RUSSO

ing facilities in Atlanta, Ga. The new plant is equipped to manufacture DDT, toxaphene and BHC concentrates to meet regional needs for these materials.

According to H. Alvin Smith, president, the Atlanta plant represents the only firm in the area specializing in basic insecticide materials for the independent manufacturer. Because Atlanta is an important center for all types of transportation, the company expects to offer quick deliveries to meet sudden infestations of insects. Over-night service may be possible in some instances, Mr. Smith said.

General manager of the new plant is Vincent Russo, formerly production manager of Powell's chemical plant in Huntsville, Ala.

#### Restrains "Acrylium"

The Acrylium Corp. of Glen Cove, N. Y., has been permanently enjoined from use of the word "Acrylium" as a trade mark or company name as a result of a suit filed earlier this year by Monsanto Chemical Co. of St. Louis who charged that the Acrylium Corp. was infringing on its trade mark "Krilium" for soil conditioners. The injunction was handed down by the U. S. District Court for the Eastern District of New York at Brooklyn. It also applies to Oscar Zurer and Raymond

Zurer as individuals and as partners doing business under the name, Long Island Paint and Chemical Co. Monsanto claimed successfully that the similarity of the two names was confusing and constituted unfair competition.

#### So. Ag. Workers Meet Feb. 9

The 50th annual meeting of the Association of Southern Agricultural Workers will be held at the Jung Hotel, New Orleans, February 9, 10 and 11, 1953. The theme of the meeting will be "Industry and Agriculture—A New Era In The South." Included on the program, as usual, will be sessions on entomology, phytopathology, soil conservation, etc. Secretary of the Association is B. B. Jones, P. O. Box 1460, New Orleans 5.

#### Berkshire Acquires Isco

Berkshire Chemicals, New York manufacturer and distributors of mercurials, zirconium chemicals, carbamates, vanadium chemicals, boron and agricultural magnesia, has purchased Innis, Speiden & Co., distributor of heavy chemicals. The chemical business of the 136-year old Innis, Speiden & Co., will continue from its Liberty Street address, according to Malcolm McAlister, president of Berkshire Chemicals, who also has been elected president of the acquired firm. Frank Grille continues as manager of the chemical department

The purchase of Innis, Speiden & Co., Inc. was made from International Minerals & Chemical Corp., Chicago, which has owned and operated the company as a division since 1950. The acquisition includes the name, assets and good-will of the chemical distribution setup of Innis, Speiden. The gum, wax and insecticide departments of the company were sold recently to other interests and will no longer be associated with the Innis, Speiden name. The insecticide business was purchased by a group of former employees of Innis Speiden who call their company Haracide Products, Inc.

#### Segebrecht Joins Spencer

Ervin W. Segebrecht has been named assistant director of sales development for the Spencer Chemical



E. W. SEGEBRECHT

Company, Kansas City, Mo. For the immediate future he will also serve as manager of the Spencer market research section.

The new sales development official has had wide experience in research with the Armour laboratories in Chicago. There he became group leader of applied research, later going into technical service. In 1949 he became sales manager of the Armour Chemical division in New York and in 1951 he was made manager of market development in the chemical division.

Mr. Segebrecht was born and reared in Kansas City, Kas., attended Wyandotte high school; Kansas City, Kas., junior college, and was graduated from Kansas State college in 1938 with a B. S. degree in Industrial Chemisstry.

#### August Fertilizer Sales Up

Tax tag sales and reports of fertilizer shipments for the month of August, 1952 show a 21% gain over the corresponding 1951 month. For the month of August, 1952, the total was 305,000 short tons of fertilizer as compared with 253,00 short tons for August, 1951. For the first seven months of 1952, the total was 7.9 million tons as against 7.3 million tons for the January through July period of 1951.

#### Soil Conditioner Conference Held in New York

HE first national Soil Conditioner Conference was scheduled to be held at Hotel Plaza, New York, Nov. 10, its purpose being to clarify the conflicting claims being advanced by producers and to exchange technical information on the whole subject of chemical soil conditioners. Richard A. Snelling of Henry A. Dreer, Inc., Philadelphia, acted as temporary chairman of the conference. An attendance of 300 to 400 persons was anticipated, invitations having been sent out to representatives from the U.S. Department of Agriculture, the Federal Trade Commission, Department of the Interior, state agricultural colleges, soil science laboratories, United Nations agricultural committees, producers of chemical soil conditioners, trade paper, radio and garden editors and independent experts.

The following was the program announced for the session:

#### "INTRODUCTORY REMARKS"

R. A. Snelling, President, Henry A. Dreer, Inc.

Evaluation of pre-chemical soil conditioner practices. Approach to scientific research in this field. Comparing approach from agricultural point of view with approach from home gardening point of view. Consideration and comparison of chemical and physical aspects.

The evolution of standards of product, performance and application.

The goal of soil conditioners as a technique of production improvement.

## "CHEMICAL EVALUATION OF SOIL CONDITIONERS"

Edward May, plastics expert, Samuel P. Sadtler and Son Chemical Laboratories

What is the chemical nature of present soil conditioners and how do they work?

What are the variables which must be considered in manufacture of these chemicals? How do soil reactions vary with varying formulations of given chemicals?

Consideration of chemical and physical properties of various soil types. Correlation of temperature and moisture conditions to soil conditioning results. How may these products be chemically evaluated?

#### "PHYSICAL AND FIELD EVALUA-TION OF CHEMICAL SOIL CONDITIONERS"

Dr. Wayne Arny, Director, Soil Research Laboratories

Correlation and comparison of chemical and physical standards for soil conditioners.

Purposes of chemical soil conditioner use, and a comparison of products and applications used for various purposes.

Reports on liquid and dry applications by various techniques.

Examination of variance due to chemical or physical properties of soil being treated—temperature conditions, moisture conditions.

Consideration of possible deleterious results from use or misuse of chemical soil conditioners.

#### "DEVELOPMENT OF MERCHANDIS-ING TECHNIQUES AND STAND-ARDS FOR NEW GARDEN PRODUCTS"

Dr. Franklin Jones, Chemical and Horticultural Consultant. Formerly, Manager Garden Products Division, American Chemical Paint

Length and approach during period of evaluation.

Approach to the consumer.

#### "TRADE PRACTICE CONFERENCES AND WHAT THEY CAN MEAN TO THE SOIL CONDITIONER INDUSTRY"

James A. Horton, Director of Bureau of Industrial Cooperation, Federal Trade Commission

#### OPEN FORUM

Including questions on data presented, and presentation of new information.

"WHAT ABOUT THE FUTURE"
R. A. Snelling, President, Henry A. Dreer,
Inc.

#### Agr. Ammonia Inst. to Meet

The Agricultural Ammonia Institute will hold its annual convention and trade show at the Baker Hotel, Dallas, Texas, December 3, 4, & 5. Displays will be shown by the leading suppliers of ammonia handling equipment and ammonia producers. Virgil Rule of Greenville Liquid Fertilizer Co., Greenville, Miss., is president of the Institute. Convention chairman is K. Doc Eldon. The group's headquarters are in the Hotel Claridge, Memphis, Tenn.

#### Shell Chem. Names Two



V. C. IRVINE

G. W. Huldrum, Jr., has been appointed sales manager, Eastern Division, Shell Chemical Corporation and V. C. Irvine has been named Western Division sales manager. Mr. Huldrum replaces J. G. Frye, resigned, while Mr. Irvine fills Mr. Huldrum's former post.

In his new position, Huldrum will supervise all sales activities east of the Rocky Mountains for Shell's solvents, resins and plastics, and industrial chemicals, with headquarters at 500 Fifth Avenue, New York City. Mr. Irvine will head sales activities in ammonia and ammonium sulphate, fertilizers, various solvents and industrial chemicals west of the Rockies. His headquarters will be at 100 Bush Street, San Francisco.

Huldrum began his career as a chemist at Shell Chemical's Pittsburg, California, plant in 1939 after completing his studies at the University of California.

Mr. Irvine joined the staff of Shell Development Company at Emeryville, Calif. in 1934, after receiving a B.S. degree at U. of C.

#### Intl. Harvester Buys Hough

The stock of Frank G. Hough Co., Libertyville, Ill., manufacturer of material handling equipment, has just been acquired by International Harvester Co. Effective November 1 the Hough Co. became the wholly owned subsidiary of International Harvester. Frank G. Hough will continue as president.



# Insistence on Integrity!

QUALITY control in pesticides doesn't just happen. It takes sharp, unsatisfied eyes that okay nothing until it has been tested and proved... and then okay only that batch. Questioning, testing eyes!

In our laboratories, careful routines are set up for mixing, measuring and packaging. More important, instructions to the chemists go something like this: "Take nothing for granted. Accept no rule of thumb. Approve nothing just because somebody else did." That is our quality control platform.

Tell your customers about this. Sell quality when you sell Thompson-Hayward pesticides. You'll sell more!



Automatic titrator used in titrations.

Control No. 17527 Tested by 3

This product has been carefully examined and found to conform with our specifications.

In case of correspondence regarding this shipment refer to the above control number.

THOMPSON-HAYWARD CHEMICAL CO.

Kansas City 8, Mo.

This certifying tag must be on every container of Thompson-Hayward chemicals.

MINNEAPOLIS . OKLAHOMA CITY

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THOMPSON-HAYWARD

CHEMICAL COMPANY

KANSAS CITY, MO.

NEW ORLEANS, LA.

DALLAS . WICHITA

MEMPHIS . CHICAGO

OMAHA . DENVER

TULSA

#### Eastern Branch A.A.E.E. to Meet Nov. 24-25

THE Eastern Branch of the American Association of Economic Entomologists will meet in Baltimore, November 24 and 25, at the Lord Baltimore Hotel. B. F. Driggers, secretary-treasurer of the branch, advises that the program was to be completed early in November, as Nov. 3rd had been set as the deadline for submission of titles. Late in October the following papers had been listed for delivery:

- An ecological Study of the Leafhopper Vectors of Blueberry Stunt Disease, By Martin T. Hutchinson, N. J. Agr. Expt. Sta., New Brunswick.
  - An ecological study of two, physically-similar leafhoppers shows their remarkable environmental separation, and indicates that only one of them is the vector of stunt disease in cultivated blueberry fields.
- (2) Seed Pelleting to Control the Onion Maggot, Hylemya antiqua. By W. A. Rawlins, Cornell Univ., Ithaca, N. Y.
  - Seed coatings containing several insecticides protected onion plants from attack by the onion maggot.
- (3) Response of Insects to Black and White Light, By S. W. Frost, Dept. Zool. Ent., State College, Pa.
  - A study of the attraction of insects to black or invisible ultra violet light between 3000 and 3800 Angstroms. Twenty families are included, many of economic importance.
- (4) On the Performance of Malathon for Pea Aphid Control. By L. P. Ditman, Amidhud Kramer and Orell Saulsbury, Jr., College Park Md. Results of replicated plot tests and on commercial treatments by plane and ground spraying.
- (5) An Insecticide-Resistant Strain of the German Cockroach from Corpus Christi, Texas. By Ralph E. Heaj. Kenneth B. Nash and Michele Williams, Elizabeth, N. J. Preliminary laboratory tests have shown that progeny of roaches collected in the field at Corpus Christi, Texas are highly resistant to chlordane and significantly resistant to lindane.
- (6)) Failure of Residual Insecticides to Control Houseflies in New Jersey. By Elton J. Hansens, Rutgers University, New Brunswick, N. J.

- Summarizes results of application chlorinated hydro-carbons in dairy barns for four years.
- (7) Gypsy Moth Control Activities in the Northeastern Region. By J. M. Corliss, Project Leader, Bureau of Ent. and Plant Quar., Agr. Res. Admin., U. S. D. A., Greenfield Mass.
  - Activities in the cooperative control of the gypsy moth (Porthetria dispar L.) are described with particular reference to accomplishments during the period from July 1, 1951 through June 30, 1952. The program included a domestic and foreign collection of gypsy moth pupae involving the collection of over a million pupae for the processing of sex-attractant trapping material; a trapping program on 6,522,515 acres resulting in a catch of 5,397 male moths: scouting surveys on 507,347 acres; and the spraying of 217,141 acres.
- (8) Causes for Variations in Rate of Evaporation from Thermal Generators. By Philip J. Spear, American Aerovap Res. Lab., Amherst, Mass.
- (9) Are Orchard Mites Becoming Resistant to Phosphate Insecticides? By B. F. Driggers, Rutgers University New Brunswick, N. J. Observations and data are presented which indicate European remites are becoming resistant to
- (10) A Two Year Study of Lindane, Methoxychlor, Parathion and Rotenone Against Asparagus Beetles with Emphasis On Residue On and Quality of Asparagus. By B. B. Pepper, Rutgers University, New Brunswick, N. J.
- (11) Granular Dusts as Mosquito Larvicides in New Jersey By D. M. Jobbins, N. J. Agr. Expt. Saa, New Brunswick, N. J. (To go with companion paper by Harrie Taft on laboratory evaluation of certain granular dust formulations using Aedes aegypts as an indicator.)
  - Laboratory and field experiments to date in the use of certain granular dust formulations as mosquito larvicides.

#### N. J. Hort. Soc. To Meet

The annual meeting of the New Jersey Horticultural Society will be held at the Hotel Claridge, Atlantic City, N. J., December 1st, 2nd, & 3rd. The afternoon of December 1st will be devoted to separate fruit and vegetable sessions. The annual dinner will be held the evening of December 2nd. December 3rd will be devoted to special programs for tomato growers and peach growers.

#### Offer New Type Fertilizer

The Illinois Farm Supply Co., Chicago, has recently developed a new type fertilizer sold under the trade name "GRO-FLO" which is reported to be free flowing in its application and uniform in chemical analysis. The new product is the result of experimentation which was begun about a year and a half ago in the East St. Louis, Illinois laboratory of the company under the direction of James E. Seymour, research chemist. The product incorporates a surface active agent, Santomerse No. 1, an all-purpose wetting agent of the anionic type manufactured by Monsanto Chemical Co., St. Louis.

The new "GRO-FLO" fertilizer has been field tested on hundreds of Illinois farms over the past year and is reported to have resulted in important economies in both time and labor. Development of the new product was described by Mr. Seymour in an address before the American Farm Research Assn. during its recent meeting at Osage Beach, Mo., October 20-21, the title of the paper being "The Use and Effect of Surface Active Agents in the Manufacture of Mixed Fertilizers."

#### Named to J-M Position

William J. Bucklee has been named general sales manager of the Johns-Manville Celite Division, the company has announced. He succeeds William D. Van Arnam, retired.

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Mr. Bucklee joined Johns-Manville as a sales representative when the Celite Products Corporation was acquired by Johns-Manville in 1928. Since that time he has held positions of sales responsibility in the North Jersey, Philadelphia and Baltimore territories and in January, 1950, was appointed Eastern District Sales Manager of the Johns-Manville Celite Division with headquarters in New York.



That's right!



#### BETNER'S SERVICE IS COMPLETE . . .

Betner can supply the special machinery for closing the "Duo-Tite" bag . . . it heat-seals, double folds and pastes the tops in exactly the same manner as the bottom is constructed.

A harvest of packaging ideas and finished bags. And Betner is especially pleased with the Betner "Duo-Tite" bag. It's designed particularly for bulk powdered products. Constructed with special liners, the "Duo-Tite" bag assures "no-sift" of particles . . . whether it contains chemicals, insecticides, fertilizers, or any bulk powdered product.

It's folded, glued and heat-sealed to positively prevent sifting. The "Duo-Tite" is available in a variety of sizes (holds 1 to 25 pounds), colors and combinations of materials. Each bag is inner-heat sealed and protected by "Duo-Tite" turnover. And the price will interest you.

• Whatever the packaging need, there's a Betner bag . . . FILL IT!

Benj C Betner Co Devon, Pa.

Plants also located in: Richmond, Virginia; Paris, Texas;
Appleton, Wisconsin; Los Angeles, California



O. H. BLANTON

#### **Pennsalt Names Blanton**

O. Harry Blanton has been appointed Southeastern District sales manager for Agricultural Chemicals by the Pennsylvania Salt Manufacturing Co., it has been announced by Arthur F. Bixby, manager of the Agricultural Chemicals Department.

Mr. Blanton, who will make his headquarters at Montgomery, Ala., assumes the duties formerly performed by J. Drake Watson, now on active duty with the U. S. Army in Korea.

The new district sales manager has been in agricultural technical service and sales work since leaving active duty in the last war and joined Pennsalt as a technical sales representative in this field in June 1951. A native of Nichols, S. Carolina, he was graduated from Clemson Agricultural College with a degree of Bachelor of Science.

#### **Western Phosphate Officers**

Western Phosphates, Inc., a new company formed by Kennecott Copper Corporation, American Smelting & Refining Company, and Stauffer Chemical Company, will operate under the following list of officers; president, H. Stauffer; vice-president and general manager, John Paul Jones; vice-president, F. W. Wieder and M. L. Spealman. An office has been established at 700 Pacific National Life Building, Salt Lake City, Utah. Mr. Jones will direct the operations of the company from this location.

Construction of the new fertilizer plant is under the direction of A. C. Mohr, chief engineer, Stauffer Chemical Co., Los Angeles. Site preparation work will commence at once and initial production is expected next fall.

#### Chile Subsidizes Fertilizer

The Chilean Ministry of Agriculture has recently acted to practically double the amount of money which has been appropriated to subsidize the use of fertilizers on essential crops. It is now reported that 574 million pesos will be required as compared with earlier estimates of 327 million pesos. The government subsidy will cover part of the cost of the containers and 50 per cent of the manufacturing tax and freight charges, plus an allowance for possible higher fertilizer prices.



PHILIPKOWSKI

Stauffer Chemical Company has announced the appointment of Stanley Philipkowski as entomologist, to be based in the Rio Grande Valley with his home office in Weslaco, Texas. Mr. Philipkoski is a graduate of Colorado A & M College with a major in entomology. He was formerly employed by the U. S. Department of Agriculture, B. E. P. Q., grass-hopper division in Wyoming and Colorado.

#### Ohio Pesticide Institute to Meet in Columbus, Dec. 9 and 10

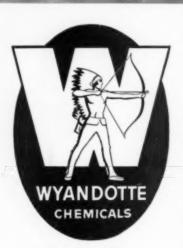
THE annual meeting of the Ohio Pesticide Institute will be held at the Deshler-Wallick Hotel, Columbus, Ohio, December 9 and 10. A series of panel discussions on soil conditioners, insecticides, fungicides, herbicides, etc., will highlight the program as announced by H. C. Young of Ohio Agricultural Experiment Station which sponsors the meeting. Harold E. Bruner of Monsanto Chemical Co., president of the group, will open the first session the morning of December 9th. Featured on the opening program will be the panel discussion on soil conditioners, with W. P. Martin of the Experiment Station leading the discussion, and E. K. Alban, D. C. Kiplinger, J. L. Haynes and G. S. Taylor participating.

The afternoon session will open with a panel discussion on fungicides for commercial crops, emphasizing what to sell in 1953. H. C. Young of the station staff will act as leader, with panel members including Frank Winter, B. F. Janson, J. D. Wilson and J. Forthofer. M. G. Farleman of Standard Oil Co. will lead a similar panel discussion, to

follow, on the subject of insecticides, with T. H. Parks, C. R. Cutright, Roy Rings, J. P. Sleesman, R. B. Neiswander, C. R. Weaver and Claude Neiswander participating. There will be a dinner session also, featuring a humorous sketch, "A Day with a Pesticide Dealer."

At the December 10th morning session officers will be elected, to be followed by a panel discussion covering chemicals and methods currently being recommended for brush control. H. E. Bruner, leader, and the following members, E. K. Alban, R. R. Davis, G. Hill, Geo. Watters, Art Doust and E. D. Witman. At the afternoon session Sam Palmer of Diamond Fertilizer Co., will lead the panel discussion on insecticides and fungicides for use in home vegetable and ornamental plantings, assisted by J. P. Sleesman, R. B. Neiswander, Paul Tilford, C. E. Brian and R. J. Conners.

Dan Kent of Goodrich Chemical Co. is 1st vice-president of the Institute. Don Zimmerman, 2nd vicepresident, is acting as program chairman for this year's session.



# DDT

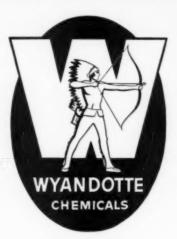
DDT, Technical (Dichlorodiphenyltrichloroethane)

Properties: Specifically 1, 1, 1-trichloro-2, 2,-bis (p-chlorophenyl) ethane. Appearance: white to cream-colored crystals. Setting point: 89°C. (minimum).

Uses: Must be formulated into wettable powders, solutions, emulsions, dusts, or aerosols for the control of insects affecting public health, agriculture, and industry.

Standard Containers: 6 ply bags, 50 lbs. net, 51 lbs. gross; Leverpak drums, 200 lbs. net, 212 lbs. gross.

Freight Classification: Agricultural Insecticide.



# BHC

Benzene Hexachloride (1, 2, 3, 4, 5, 6-hexachlorocyclohexane)

Properties: A complex mixture of isomers having the empirical formula  $C_6H_6Cl_6$ . Appearance: white to lightbrown crystals. Gamma isomer content, % by weight: 14 (average).

Uses: Effective in the control of a number of agricultural insects such as aphids, cotton insects, and soil insects. Widely used in the control of migratory locusts and as an insecticide for the control of insects affecting man and animals.

Standard Containers: Leverpak drums, 200 lbs, net, 213 lbs, gross,

Freight Classification: Technical Benzene Hexachloride (Hexachlorocyclohexane).

MAY WE supply you with DDT, BHC and other basic chemicals\* for agricultural use?

Wyandotte's 62-year reputation, vast resources and experience in the agricultural field assure you of a dependable source of supply and capable technical service.

Contact our nearest district office, or write: Agricultural Chemicals Department, Wyandotte Chemicals Corporation, Wyandotte, Michigan. Offices in Principal Cities.



 Wetting agents \* Emulsifiers \* Soil Conditioners Solvents \* Fumigants \* High Gamma BHC Chlorine and Benzene.

#### Dec. Cotton Insect Meeting

The Sixth Annual Cotton Insect Control Conference is scheduled to be held at the Peabody Hotel, Memphis, Tenn., December 10 and 11, according to Claude L. Welch, director, National Cotton Council of America's division of production and marketing.

Mr. Welch says that a "most interesting program" is being arranged with reports bearing on this year's experience and next year's plans for insect control. More emphasis will be placed on the pink bollworm this year than in past programs, he said. A full two day program is being planned.

Headquarters for the conference will be at the Peabody Hotel, but other hotels in the neighborhood are cooperating with the Council in reserving rooms for convention attendants. These hotels include the Claridge, King Cotton, Tennessec, William Len, Gayoso and Chisca. Mr. Welch suggests that any one of the hotels should be contacted as soon as possible and that early reservations are desirable since an unusually large crowd is expected.

#### **New Fertilizer Plant**

Members of the Consumers Co-operative Association were to visit Lawrence, Kansas, December 3rd to attend the formal cornerstone laying for a 15-million-dollar fertilizer plant which is to be built by their organization near Lawrence. The cornerstone will be in an office building, construction of which is expected to begin shortly. Howard A. Cowden is president and general manager of the Consumers Co-operative Association.

#### Koos & Son Elect

R. P. Koos has been elected president of N. S. Koos & Son Co. 4610 13th Court, Kenosha, Wisc., succeeding the late Edward J. Koos. Grace A. Koos has been elected secretary, resuming active duties following ten years of retirement during which time the company was managed by her brothers. The new president of the firm has served as secretary-treasurer since 1937.





GILES ST. CLAIR



RALPH OLSON

#### Penick Names Three V-P's

Election of Ralph Olson, Giles St. Clair and Carlos Lopez, as vice-presidents of S. B. Penick & Company, has been announced by S. B. Penick, Jr., president.

Mr. Olson has been with the Penick organization for seventeen years and for the past five years has been in charge of the Chicago branch as manager. He was president of the Chicago Drug and Chemical Association in 1951 and is well known in insecticide circles in the Middle West.

Mr. St. Clair is manager of Bulk Pharmaceutical Department while Mr. Lopez is in charge of Foreign Purchases Department; both have been with the firm for thirteen years.

#### **Hercules Supervisors Meet**

Research supervisors from thirteen plants of Hercules Powder company met at Wilmington, Del. on October 13 and 14 for the 9th annual company-wide research conference at the Hercules Country Club. The two-day meeting was opened Monday by Dr. Emil Ott, director of research and Dr. Peter Van Wyck, associate technical director of the Hercules Experiment Station led a discussion on "Keys to Process Savings."

At a dinner October 13, Dr. W. K. Lewis, professor of chemical engineering, Massachusetts Institute of Technology, addressed the supervisors on "Intellectual Contributions of Applied science." L. N. Bent, retired Hercules vice-president, was a special guest.

Dr. R. W. Cairns, assistant director of research was discussion leader Tuesday morning as the group considered "Keys to New Products." The afternoon session, with Dr. R. F. Schultz, technical director of the Hercules Experiment Station as moderator, heard a discussion on "Keys to New Sales." Charles A. Higgins, Hercules president, spoke at the closing dinner session Tuesday night.

The following research supervisors from Hercules plants were in attendance at the conference:

R. Winer, Cumberland, Maryland; C. E. Tyler, Brunswick, Georgia; B. F. Lokey, Burlington, New Jersey; F. H. Gardner, Jr., Hattiesburg, Mississippi; P. D. Applegate, Holyoke, Massachusetts; R. W. Eyler and W. L. Stafford, Hopewell, Virginia; E. S. Goodyear and H. H. Champney, Kenvil, N. J.; C. J. Campbell and Einar West, Mansfield, Mass.; R. M. Brooks, H. Fox, and J. S. Tinsley, Parlin, N. J.; A. F. Giacco and W. E. Howell, Radford, Virginia; J. B. Loucks, Savannah, Georgia; J. E. Midgarden, Lawrence, Kansas; and H. I. Etchells, Jr., Port Ewen, New York.

#### Monsanto Ups Mowry

The transfer of Dr. David T. Mowry, Dayton, Ohio, to the development department of Monsanto Chemical Company's Phosphate Division has been announced by the company. The transfer was effective November first.

# Du Pont Announces

# MANZATE<sup>†</sup>

FUNGICIDE

BASED ON MANGANESE ETHYLENE BISDITHIOCARBAMATE

# For TOMATOES and POTATOES

EXPERIMENTAL QUANTITIES NOW AVAILABLE

"Manzate," sixth in a series of famous dithiocarbamate fungicides developed by Du Pont, has special advantages on tomatoes and potatoes. Several years' tests in 32 states, Hawaii, Canada and Mexico show:

FOR TOMATOES, "Manzate" fungicide provides a single material which is effective against all the major fungous enemies of tomatoes. Now a program is offered using "Manzate" alone to control diseases straight through the season, instead of alternate chemicals in separate sprays. "Manzate" is effective against early and late blight, anthracnose, gray leaf spot (Stemphyllium), and Septoria leaf spot.

FOR POTATOES, "Manzate" is particularly effective against both early blight and late blight, especially when both these diseases are severe at the same time. For this crop, too,

"Manzate" provides excellent protection the season long.

#### SUPPLIES FOR EXPERIMENTAL USE

Tomatoes and potatoes appear to offer the best opportunity for applications of "Manzate" during 1952. Since production is so new, supplies of "Manzate" this season are limited. But experimental small quantities are available for research purposes. Additional trials of "Manzate" will be made in 1952 on many other vegetable and fruit crops. For further information, write to Du Pont, Grasselli Chemicals Dept., Wilmington, Delaware.

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On all chamicals always follow directions for application. Where warning ar coulian statements an use of the product  $\epsilon$  , given, read them carefully,

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BETTER THINGS FOR BETTER LIVING ... THROUGH CHEMISTRY

AGRICULTURAL CHEMICALS

### **Agronomists to Cincinnati Meeting**

THE Netherland Plaza hotel, Cincinnati, Ohio, is the place scheduled for the 1952 meeting of the American Society of Agronomy November 17-21.

The first day's program will include the presentation of technical papers and a panel on the corn fertilization program in cooperation with the National Joint Committee on Fertilizer Application. R. L. Carolus, Michigan State College is to preside at this session which is built around the theme of "King Corn." Appearing on the program will be L. L. Huber, Pennsylvania Agricultural Experiment Station, speaking on, "King Corn of the Future;" Dr. J. D. Sayre, Ohio Agricultural Experiment Station, Wooster, "The King's Diet;" Roswell Garst, Iowa "Farmer Extraordinary," will talk on "My Experiences With Fertilizer;" and George V. Taylor, Spencer Chemical Co., Kansas City, Mo., "King Corn's Friend."

'A panel disscussion will follow under the title of "Royal Treatment for King Corn." Dr. H. B. Siems, Swift & Company, Chicago, will be moderator with the following appearing on the panel itself: M. L. Jackson, University of Wisconsin, Madison; Dr. Firman E. Bear, New Jersey Agricultural Experiment Station, New Brunswick, N. J.; B. A. Krantz, U. S. Department of Agriculture; and W. C. Johnstone, Kentucky Banker's Association.

On November 18, a session on weed control will be held with W. C. Shaw, U.S.D.A., as chairman. Papers describing the results of various experiments will be presented by the following, according to the advance program:

F. W. Slife, Illinois Agricultural Experiment Station; Richard J. Aldrich, U.S.D.A., New Brunswick, N. J.; W. E. Chappell, Virginia Agricultural Experiment Station; Dayton L. Klingman, U.S.D.A., Lincoln,

Nebraska; H. D. Woofter, A. S. Newman and H. T. DeRigo, Chemical Corps., U. S. Army, Camp Detrick, Frederick, Md.; Lyle A. Derscheid, South Dakota Agricultural Experiment Station; G. D. Hill and C. J. Willard, Ohio Agricultural Experiment Station; and Lowell W. Rasmussen, Washington Agricutural Agricultural Experiment Station.

A session on soil fertility, fertilizers and plant nutrition will be held Wednesday, Nov. 18, with L. B. Nelson, U.S.D.A., Ft. Collins, Colo. as chairman. This session will be continued on the afternoon of the 20th with Mr. Nelson in charge.

Numerous other sessions throughout the week will be included under the Agronomic Education Division, Soil Science Divisions, and Crop Science Divisions. The annual dinner will be held Wednesday night, November 19, with an address, "Irrigation Agriculture" by D. W. Robertson, ASA president. The Society will announce its officers for next year at the dinner.

#### Esberg Heads New Dept.

Appointment of Alfred M. Esberg as head of the newly-organized sales development department of American Potash & Chemical Corp., Los Angeles, has been announced by the company. Mr. Esberg was formerly president of Eston Chemicals, Inc., Los Angeles, before Eston's merger with American Potash. His new responsibilities will include coordination between research and sales of all activities of both American Potash and Eston.

Through the new sales development department, the corporation expects to open new markets for lithium, boron and bromine compounds now being developed in the American Potash research department. Many of these compounds are said to be unique in the chemical field.

#### Van Winkle to Atlas



DIXON VAN WINKLE

Dixon Van Winkle has been appointed special sales assistant in the sales division of Atlas Powder Company's industrial chemicals department, it has been announced by K. E. Mulford, general manager.

Mr. Van Winkle, formerly eastern general manager for Julius Hyman Company, will report directly to George J. King, director of sales at Atlas. His duties will consist of correlating sales efforts in specific fields of sorbitol usage.

#### Cyanamid Safety Week

American Cyanamid Co., New York, were scheduled to observe safety reminder week in the company's 42 plants the week of November 3rd. According to S. F. Spence, Cyanamid's Safety Director, the purpose is to enlist employee cooperation in improving the company's already exceptional safety record, which last year showed an accident rate 57% lower than the average for other firms in the chemical manufacturing industry. Each individual plant was to conduct its own program, featuring special safety posters, training in housekeeping, fire safety, personal protective equipment,

#### Leiser Represents W. C. D.

D. R. Leiser, vice president of Harry Holland & Son, has been appointed to represent Whittaker, Clark & Daniels in Michigan. He succeeds R. G. Smith who has been made an executive salesman in New York City. Whittaker, Clark & Daniels are now representing the W. H. Loomis Talc Corp., Gouverneur, N. Y., on sales of their talc.

## Sturtevant Dry Batch

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The Sturtevant Dry-Batch Mixer is an efficient rotating drum-type machine for mixing various substances together into a homogeneous and inseparable whole, every part of which presents the same analysis. The substances may be of different weights and physical properties, and may be either dry, partly dry, or a mixture of both.

Because of the unique design of its mixing chamber, and the 4-way mixing action which brings two or more substances together, the Sturtevant Dry-Batch Mixer does a more rapid mixing job than other machines and, at the same time, it is complete and thorough in every particular.

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- Only one lever controls both receiving and discharging for simplicity of operation. Hand wheel operates rack and pinion slide at feed opening.
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- 5 models...a size for every mixing job... smallest size mixes up to 7½ tons per hour... largest size up to 75 tons per hour.

#### **Calspray Appoints Weidoff**

The appointment of Paul M. Weidoff as foreign sales representative in the Eastern Division, has been an-



PAUL M. WEIDOFF

nounced by California Spray-Chemical Corp. Mr. Weidoff will make his headquarters at the company's Elizabeth, New Jersey, plant, assisting in the export of agricultural chemicals on the eastern seaboard, since he is acquainted with the pesticides, fungicides and herbicides which Calspray has been exporting to world markets for many years.

Mr. Weidoff is a native of Is-Sur-Tille, France, and was educated at the University of Panama and the University of California.

#### U. C. C. Chairman Dies

Fred H. Haggerson, 68, chairman of the board of Union Carbide and Carbon Corporation, died in New York City, October 14, after a short illness.

Mr. Haggerson had been with Union Carbide for over 33 years, and became chairman of the board in 1951. He had been made vice-president of the corporation in 1938, a director in 1941, and president and member of the executive committee in 1944. He promoted a liberal policy of research and expansion that has been in a large measure responsible for the growth of the Corporation.

A native of Spalding, Michigan, Mr. Haggerson was educated in the public schools of Menominee, Michigan, and later went to the Holbrook School, Briarcliff, New York. He attended Hamilton College, Clinton, New York, and completed his education at the Law School of the University of Michigan, from which he was graduated with a Bachelor of Laws Degree in 1907.

#### Soil Conditioner Output Up

Fifty to one-hundred million pounds of soil conditioner may be needed each year in the United States alone, it has been estimated by Robert L. Wilson, president of Wilson Organic Chemicals, Inc., Sayreville, N. J., producers of "Poly-ack." The Wilson firm is a pioneer producer of this new agricultural chemical field. The estimate was made on the basis of the land necessary for increased cultivation in the U.S. To fill the demand for soil conditioners will take the full manufacturing facilities of the industry several years, according to Mr. Wilson. To meet this demand, Wilson Organic is planning an expansion program to be fully effective in early 1953.

#### Barrett to Davison

Appointment of Dr. Wayne T. Barrett as manager of the research department of the Research and Development Division of The Davison Chemical Corporation, has been announced by Dr. Paul W. Bachman, director of the division.

Dr. Barrett holds bachelor's and master's degrees in chemistry at Michigan State and a Ph.D. from the University of Pittsburgh. He was formerly with the Phillips Petroleum Company and the Mellen Institute. He joined Davison in 1950.

DR. W. T. BARRET



#### **Gunter To Hercules Powder**

Allen C. Gunter, former state entomologist with the Texas Extension Service, has joined the agricul-



ALLEN C. GUNTER

tural chemicals section of Hercules Powder Co., Wilmington. He will have headquarters at the company's Dallas office, where he will be concerned principally with the uses of toxaphene insecticides on cotton and other crops produced in the area.

Mr. Gunter received his B.S. degree in agriculture from East Texas State Teachers College, and for the next two years was principal of the Plantersville, Texas high school. In 1941 he entered the U. S. Army as a private, rising to the rank of captain before his discharge in 1946. He received his M.S. degree in entomology from Texas A & M in 1947, and remained at College Station, first as a research entomologist, and from 1949 as state extension entomologist.

#### Dr. Jaeger Honored

Dr. Alphons Otto Jaeger, chairman of the Development Committee and director of the General Technical Department of American Cyanamid Company, has been named a Pennsylvania Ambassador by the Pennsylvania State Chamber of Commerce. Dr. Jaeger, founder of the Bridgeville plant of the Selden Division of American Cyanamid, was presented the Ambassador Award Thursday evening, October 16th, at a banquet given by the Bridgeville, Pa., Chamber of Commerce.

# More Books ....

#### **Insect Resistance in Crop Plants**

by Dr. Reginald H. Painter

520 pages, price \$9.80

Here is a complete analysis of the relationship between crops and phytophagous insects together with a full analysis of the insect resistant varieties of important crops, such as wheat, corn, cotton, sorghums, potato.

#### Soils and Fertilizers

by F. E. Bear

375 pages, price \$4.50

This text presents the basic scientific facts and principles behind the production and utilization of agricultural chemicals. The why, when, where and how of fertilizers is expressly discussed, with particular emphasis on the importance of lime and fertilizer materials in maintaining and increasing the productivity of soils.

#### Weed Control

by W. W. Robbins, A. C. Crafts, and R. N. Raynor

543 pages, price \$6.00

Here is an authoritative, thorough book that gives you all the data and practical help you need to prepare—and carry out — a tested, efficient, successful method of attack on any weed in any location quickly and effectively. Based on experience, research and experiment, it shows what methods of weed control have proved most effective for weeds of all species — from crab grass to wild mustard — points out what methods can be applied economically in certain areas — shows how and when to apply a control measure, the season and rate of application, donage, etc., and outlines the materials and machinery needed.

#### Chemistry and Uses of Insecticides

by E. R. de Ong

445 pages, price \$6.75

Written by an outstanding student of entomology and agricultural technology, this book covers all the major insecticidal agents in detail, describing not only their chemical nature and properties, but also their specific action on various types of insects, their methods of application, and their effect on animals and humans.

#### Soils and Soil Fertility

by L. M. Thompson

330 pages, price \$5.00

This authoritative treatment begins by telling what soil is — what makes it up physically, chemically, biologically —and what its moisture-holding characteristics are. The use of commercial fertilizers and farm manure are other subjects under discussion.

Order direct from
Agricultural Chemicals
175 Fifth Ave.
New York 10, N. Y.

### Grace Chemical Company Formed; To Build New Plant Near Memphis

FORMATION of Grace Chemical Co. and purchase of a 277-acre site near Memphis, Tenn. for an ammonia-urea plant, has been announced by J. Peter Grace, Jr. president of W. R. Grace Co., parent firm and the new wholly-owned subsidiary, Grace Chemical Co. The new plant, to be located in the Woodstock area about six miles from Memphis, will be the first manufacturing unit of the new company.

The plant, to cost approximately eighteen million dollars, will produce nitrogen in the form of ammonia and urea for both agricultural and industrial uses. An arrangement has been made with the Davison Chemical Corp., of Baltimore, to act as advisor on engineering and other matters during the construction period which is expected to be started in less than three months, or as soon as the land can be cleared. Approximately 750 will be employed in the construction phase while a permanent operating staff of about 300 will be employed eventually. The total payroll is expected to amount to more than \$1.25 million. The plant will be the first of its type in Tennessee. Memphis, as marketing center for a seven-state area, will allow broad distribution of products at minimum transportation rates. Grace officials noted that Woodstock is a rapidly expanding industrial area offering excellent facilities to industrial establishments. Plants owned by Montana Ferroalloys and Du Pont already are in operation on sites adjoining that of the new Grace enterprise.

Grace has been a major industrial and trading concern along the West Coast of South America and in the United States for many of its almost 99 years. In the United States, a subsidiary, Naco Fertilizer Company, operates factories and farm stores in the Carolinas, Florida, Ohio, and California. Grace activities on the U. S. Pacific Coast include the

importing and exporting of many commodities, trading, ships' agency, fertilizers, agricultural chemicals, farm machinery and agricultural equipment sales, the distribution of diesel and fuel oil, and others.

Directors of Grace Chemical Company will include Charles E. Wilson, former president of the General Electric Company and first chairman of the Defense Mobilization Board; Robert T. Haslam, former vice-president and director of Standard Oil Co. (New Jersey), and president of United States Pipe Line Company; Bradley Dewey, president of the Dewey and Almy Chemical Company and wartime U. S. Rubber director; Professor Edwin R. Gilliland, dean of engineering of Massachusetts Institute of Technology. Grace has appointed John Carriere, now manager of the Engineering and Construction Division of the Hanford Works of the Atomic Energy Commission's program, as plant manager.

#### Reorganizes Divisions

Mathieson Chemical Corp., Baltimore, has announced a new plan of divisional organization, following the corporation's recent expansion merger with E. R. Squibb & Sons. Operations, sales and development activities have been placed in four major divisions. S. L. Nevins will be president of Mathieson Agricultural Chemicals Co. Headquarters of the



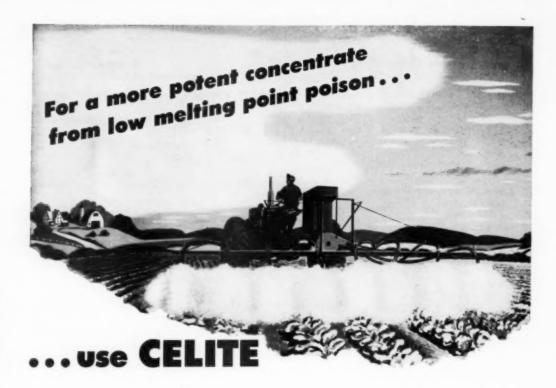
S. L. NEVINS

Mathieson Agricultural Chemicals Co. division will be in Little Rock, Ark. Donald W. Drummond heads Mathieson Industrial Chemicals Co., Carl F. Prutton is president of Mathieson Development Co., and Theodore Weicker, Jr., of E. R. Squibb & Sens. Thomas S. Nichols, president and chairman of the board, of Mathieson Chemical Corp., will assume added responsibilities as chief executive officer of the drug and pharmaceutical divisions, comprising the activities formerly carried on by E. R. Squibb & Sons. John C. Leppart continues as executive vice-president of the corporation.

#### California Fertilizer Ass'n in New Headquarters



The new home of the California Fertilizer Association is pictured above. It is the Booth Building, 475 Huntington Drive, San Marino, Calif., not far from Los Angeles. Sidney H. Bierly, CFA executive secretary, makes this address his headquarters. The CFA is holding its annual convention at the Desert Inn, Palm Springs, Calif., this month. (The meeting report will appear in next month's issue)



One way to be sure of producing a dry dust concentrate that will give top performance in the field is to use Celite in your primary grinds.

The presence of only a small percentage of this diatomite powder—because of its great bulk per unit weight, and the irregular shape of the individual particles—fluffs up the final dust. This helps neutralize the effect of heavy extenders—insuring better dispersion of the poison.

Celite is also an excellent absorption medium for liquid poisons. Its exceptionally high absorption capacity permits a much higher percentage of liquid poison to be absorbed while still maintaining a dry dust concentrate. This results in a more potent effect in the final product . . . as well as in lower packaging and shipping costs. Why not investigate the use of Celite as a means of improving your product and making your operation more profitable? For further details, write Johns-Manville, Box 60, N. Y. 16, N. Y.

#### **Properties of CELITE**

PINENESS: Approximately 100% through 325 mesh DENSITY (Vibrated): 11 pounds per cubic foot BUIK: Celite bulks much higher than most diluents ABSOPPTION: 200% of its weight of water 300% of its weight of kerosene

pH VALUE: Below 7.0
INERTNESS: Compatible with insecticide and fungicide

SUSPENSION: Excellent in both air and water
COMPOSITION: Celite is amorphous diatomaceous silica

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DILUENTS AND GRINDING AIDS

94

AGRICULTURAL CHEMICALS

#### AS WE GO TO PRESS ...

#### Spencer Chemical Co. Opens Sales Offices



S. R. WHITE



W. E. HUBBARD

Spencer Chemical Company, Kansas City, Mo., has announced the opening of two new district sales offices in the midwest and south. The north central district sales office will be located in the First National Bank Building, Chicago, and the Mid-West district sales office in the Union Planters Bank Building, Memphis.

With the southeastern district sales office, established last year in Atlanta, Spencer will now be in position to give "on the spot" service to any customer in its sales area.

The expansion brought promotions to two of Spencer's sales representatives, S. R. White, until recently stationed in Indiana-Kentucky, and W. E. Hubbard, of the Mississippi-Arkansas territory. Spencer's Atlanta office has been managed, from the first, by John L. Sanders.

Ray White was born in Richmond, Mo., and educated at Pittsburg Teachers College. He was on the sales staff of Swift and Company in Missouri and Kansas, but resigned in 1946 to join Spencer. With Spencer, Mr. White has worked in Missouri, Kansas, Arkansas, Illinois, Kentucky and Indiana.

W. E. Hubbard, new district sales manager in the Mid-South, was born in Mississippi and educated at Mississippi State College. After various posts with the state extension service, the experiment station and the U.S.D.A., Hubbard "got into nitrogen" as a Barrett Div. salesman in central Mississippi. Before joining Spencer in 1945, he had served for two

years as Barrett's assistant west coast manager and for a year with the Mississippi Extension department.

#### "Cash in on Corn," NFA Film

The National Fertilizer Association's new color-sound movie, "Cash In On Corn" is set for its premier at the Association's 26th Southern meeting at the Roney Plaza Hotel, Miami Beach, Fla., November 19-21. The picture, which runs for twenty minutes, is composed of three main parts, the Association says. First, it depicts the ten steps necessary to grow corn at the rate of 100 bushels per acre. Among the steps recommended are the application of insecticides, herbicides and fertilizers. Actual pictures of corn growth, with a cartoon recapitulation, make up this portion of the film.

The second portion describes the effect on soil of high yields of corn as compared to low yields. Statements declaring that high yields lend themselves to soil conservation are made by authorities including Dr. R. M. Slater, chief, Soil Conservation Service, U.S.D.A.; W. E. Colwell, head, Department of Agronomy, North Carolina State College; Arnold W. Klemme; R. Q. Parka, head, Division of Soil Management and Irrigation, U.S.D.A.; and George Scarseth, director of research, American Farm Research Association.

The economic benefits to be derived from production of high corn yields comprise the third portion of the picture. Comparative figures of income between a yield of 48 bu. per acre against 106 bu. per acre are presented.

Acting in an advisory capacity in the development of the film were Drs. Colwell, Parks, Salter and Scarseth, plus Drs. Porter Hedge, assistant to the Administrator, PMA, U.S.D.A.; and H. H. Tucker, director, Coke Oven Ammonia Research Bureau, Columbus, Ohio, and chairman of NFA's Plant Food Research Committee.

The film is available for loan to national, state and local agricultural agencies and institutions, members of the fertilizer industry and other interested persons. It may also be purchased at the cost of reproduction.

#### N.Y. Conference Under Way

The annual New York State Insecticide-Fungicide Conference was to be held at Ithaca, N. Y., November 11-13. According to the advance program, a full schedule of technical papers and reports of results of pesticide use in 1952 was on the agenda.

Chairmen for the various sessions included Prof. O. C. French; Dr. F. F. Hill, Provost, Cornell University; Prof. W. W. Gunkel; Dr. P. J. Chapman; J. K. Hamilton; Dr. Wm. F. Mai; and H. H. Schwardt.

Final item on the program was to be a presentation of the vegetable disease recommendations for 1953, with Dr. Charles Chupp in charge. Other subjects on the agenda for discussion included application problems, a panel on insect resistance to pesticides; herbicides, insecticide fungicide combinations and reports on insecticide tests during the past season. The annual banquet was scheduled for Wednesday evening.

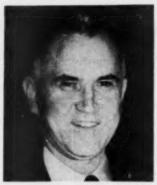
#### AAEE Program Plans Grow

Program plans for the Dec. 15-17 meeting of the American Association of Economic Entomologists were not complete at press tine, but the convention was scheduled to hear Dr. E. F. Knipling, AAEE president on the opening morning. A panel on public relations will follow. Members of the panel will include Monty Budd, Hercules Powder Co., Wallace Moreland, Rutgers University, and David G. Hall, U.S.D.A.

A full day of sessions is slated for Dec. 16, including papers on influence of pesticides on flavor of fruits and vegetables.

Dr. Glenn Richards, U. of Minnesota, president, Entomological Society of America, will address the group on Wednesday. All sessions will be held at the Bellevue-Stratford Hotel, Philadelphia.

#### Hans Stauffer Exec. V-P



HANS STAUFFER

Christian De Guigne, president of Stauffer Chemical Company, has announced the appointment of Hans Stauffer as executive vice-president of the company. Mr. Stauffer has been a vice president and the general manager since 1941. the sulfur supply situation has improved to the extent that consumers' and producers' inventories based on present consumption will amount to about 3.6 million long tons by the end of the year.

A representative of the Tennessee Valley Authority reviewed technical developments in Western Europe and the United States on four processes for the production of nitraphosphates which eliminate, or greatly reduce, the consumption of sulfuric acid. Each of the processes uses nitric acid in combinations with other materials such as, phosphoric acid, sulfuric acid, and potassium sulfate.

Study of the processes, the TVA spokesman stated, indicated that nitraphosphates could be made at a cost 20 percent under processes ordinarily used to produce similar complete fertilizer products.

An Atomic Energy Commission representative urged the industry to cooperate with the Government in its efforts to promote the recovery of uranium as a by-product of concentrated superphosphate production. One such plant is now in operation and three other plants are under construction, he said.

P. H. Groggins of NPA's Chemical Division presided.

The following members from industry attended:

John R. Scherm, American Agricultural Chemical Corp., New York City; W. E. Shellburne, Hurt Building, Atlanta, Ga.; William Caspari, Jr., Davison Chemical Corp., Baltimore, Md.; E. W. Forkin, Forkin Phosphate Co., Green Bay, Wis.; R. L. King, Georgia Fertilizer Co., Valdosta, Ga.; Arthur R. Mullin, Indiana Farm Bureau Cooperative Ass'n, Inc., Indian-apolis, Ind.; J. W. Rutland, International Minerals & Chemical Corp., Chicago, Ill.; J. C. Dean, Knoxville Fertilizer Co., Knoxville, Tenn.; Sam Nevins, Mathieson Chemical Corp., Baltimore, Md.; M. F. Field, Meridian Pertilizer Co., Hattiesburg, Miss.; Ralph E. Fraser, Northern Chemical Industries, Baltimore, Md.; C. D. Shallenberger, Shreveport Fertilizer Works, Shreveport, La.; W. B. Copeland, Smith-Douglass Co., Inc., Norfolk, Va.; Hans Stauffer, Stauffer Chemical Co., New York City; R. S. Rydell, Swift and Co., Chicago; F. W. Darner, Tennessee Corp., New York City; Raymond R. Hull, I. P. Thomas & Son Co., Camden, N. J.; William R. Thurston, Thurston Chemical Co., Joplin, Mo.; J. A. Howell, Virginia-Carolina Chemical Corp., Richmond, Va.

#### NPA Eases Certain Fertilizer Restrictions

A cut-off date of December 15 was recommended on October 7, to the National Production Authority on applications for certificates of necessity for new facilities for normal and concentrated superphosphates. The recommendation was made by the Phosphatic Pertilizer Industry Advisory Committee in its meeting in Washington.

Presently-indicated facility expansion for production of various phosphatic fertilizer products would increase the production by 893,000 short tons annually by 1955, according to NPA estimates. The 1955 expansion goal is 3,600,000 tons as compared to 2,200,000 produced in 1951.

The committee also showed concern about the price structure on phosphate rock and recommended that NPA should request the Office of Price Stabilization to assure that unfavorable prices would not jeopardize success in achieving necessary production of phosphatic materials.

Most of the phosphatic fertilizer industry was using as much sulfur as permitted under Order M-69, but since the order was revoked on November 5, the full 100% 1950 base is now expected to be used.

It also declared that demand

for phosphatic fertilizers is expected to increase about 71/2% per year which would make demand for the calendar year of 1953 about 2.5 to 2.6 million tons of PaOs. Increased use east of the Appalachians would not exceed 5% but growth in the central plains and west coast areas might well exceed 10%, it was said. Since demand for concentrated superphosphates is increasing rapidly, an increase of 150% should find a ready market, particulary in the central plains area. Potential storage problems will be alleviated considerably by the industry's emphasis on higher analysis products.

NPA told the committee that 41 projects are contemplated by the industry to meet the 1955 expansion goal of 3,600,000 tons capacity. Of the 41 projects, 12 have been completed and are in production. Eleven other projects have filed applications with the NPA Chemical Division for controlled materials.

The completed portion of the plant expansion program accounts for 20 percent of the required expansion to meet the goal. Total annual capacity of the 41 new facilities is estimated at 893,110 net tons.

NPA told the committee that

#### R. L. Hockley Becomes Davison President

E LECTION of R. L. Hockley as president of The Davison Chemical Coropration, Baltimore, has been announced. He succeeds in 1919 with American Hammered Piston Ring Company, which had been acquired by Bartlett Hayward Co. A year later he became president



CHESTER F. HOCKLEY

Chester F. Hockley, formerly president, as well as chairman, who will continue in the latter post.

Thus, R. L. Hockley advances from executive vice-president to the presidency of the corporation which he helped his father to bring to its present position. The elder Hockley, as receiver, assumed direction of the old Davison Chemical Company in 1933 and has continued in charge of the reorganized corporation. During this period, sales have increased from about \$7,000,000 to approximately \$50,000,000 annually.

The new president moved from engineering to sales, then to general management. He was educated at Gilman Country School, Baltimore Polytechnic Institute, Phillips Andover Academy and Cornell University, coming with Davison in 1934. After a brief engineering employment at the Curtis Bay plant in Baltimore, he came to the company's city office and entered the operations department. In 1942 he was made vice-president for marketing and in 1951, executive vice-president.

Chester F. Hockley, chairman of the board, a native of Pennsy-Ivania, also had early engineering experience. He first came to Baltimore



R. L. HOCKLEY

of the piston ring subsidiary and eventually, in 1931, president of the parent company.

When Mr. Hockley was named receiver for the old company, Davison was almost exclusively a fertilizer company. He saw opportunities for reorganization, initiated a program of diversification into general industrial chemicals, and eliminated fertilizer operations which had proved unprofitable.

All other officers were reelected to their present posts. Directors re-elected by the stockholders were Thomas B. Butler, M. G. Geiger, R. L. Hockley and Walter L. Price.

#### N. E. Weed Conf. Jan. 7-9

Members of the Executive Committee of the Northeastern Weed control Conference met at the Hotel New Yorker on October 9 to plan for the next Northeastern Weed Control Conference. This will be held on January 7, 8, and 9, 1953 at the Hotel New Yorker, as in the past.

Those present were president C. E. Minarik, Camp Detrick; vicepresident R. H. Beatty, American Chemical Paint Co.; secretary-treasurer W. C. Jacob, Cornell University; program committee chairman R. J. Aldrich, Rutgers University; coordinating committee chairman S. N. Fertig, Cornell University; publication committee chairman W. C. Shaw, Division of Weed Investigations, U. S. Department of Agriculture; sustaining memberships chairman C. J. Noll, Pennsylvania State College; public relations chairman A. O. Kuhn, University of Maryland.

Chairmen for the program sections were selected at this meeting and are as follows: General Program R. J. Aldridge; Agronomic Crops and Turf-T. E. Odland; Horticultural Crops S. E. LeCompte; Controlling Woody Plants & Special Problems-W. C. Bramble; Public

Health-A. H. Fletcher.

The committee decided that all titles for papers to be presented at the next Annual Conference should be submitted to the appropriate section chairman by November 1. The completed stencils for these papers are due in the secretary-treasurer's office by December 1.

A new phase of the program will be a symposium on "Methodology Involving Herbicide Evaluation." This symposium is being arranged because of the growing interest and need for exchange of information on screening techniques and associated problems.

The Executive Committe was to meet again, at the Hotel New Yorker, on November 13th, to take further action on plans for the coming meeting.

#### Murphy Rohm & Haas V-P

Donald F. Murphy has been elected a vice-president of Rohm & Haas Company, Philadelphia, the firm has announced. Upon graduation from the Massachusetts Agricultural College in 1930, Mr. Murphy began as an entomologist in the company's laboratories, and later became head of its entomology laboratory at Bristol, Pennsylvania. In June, 1943, he was appointed sales manager of the company's Agricultural & Sanitary Chemicals Department, and in recent years has, in addition, directed sales of its Textile and Export Departments.

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#### Pitts Ag. Appoints Two



A. L. WIGGER C. A. PAULSON

Pittsburgh Agricultural Chemical Company, a division of Pittsburgh Coke

new sales division heads.
C. A. Paulson will have charge of the Memphis, Tenn., sales office, and A. L. Wigger will head the Atlanta, Ga., company has announced. office, the Agricultural Chemical

Pittsburgh Agricultural Chemical Company manufactures and markets weed killers and insecticides.

#### Ill. Spray School in Jan.

Notice of the fifth Custom Spray Operator's Training School have been sent out by H. B. Petty, Illinois State Natural History Survey. The school is to be held January 15 & 16 at the University of Illinois, Urbana.

Program plans were not ready to be announced at press time, but preliminary plans called for discussions on weed control in crops, brush control, liquid fertilizers and insect control. The school is open for commercial applicators, of course, but will welcome dealers, salesmen, manufacturers' representatives, farmers and other interested persons.

Details of the program will be forthcoming later, according to Mr. Petty. In the meantime, those expecting to come should arrange for hotel space, he said.

#### Glendon Moves Nov. 15

Glendon Pyrophyllite Company has moved its offices from New York to 1194 E. Wendover Ave., Greensboro, North Carolina, according to Albert P. Braid, president of the company. The new mailing address will be P.O. Box 2414, Greensboro. Telegrams and mail will be delivered promptly at the new office which was to open November 15, Mr. Braid said.

Glendon is associated with Carolina Pyrophyllite Company and United Feldspar and Minerals Corporation. The new office arrangement allows a consolidation of its main office and the control laboratory.

#### LEGAL NOTICE

Statement of ownership, management, circianton, etc., required by the Act of Congress
f August 24, 1912, as amended by the Acts
f March 3, 1933, and July 2, 1946 (Title 89,
nited States Code, Section 238).
Of Agricultural Chemicals, published monthly
Baltimore, Maryland, for October 1, 1952.
1. That the names and addresses of the pubsher, editor, managing editor and business
nanagers are: Publisher, Industry Publicanos, Inc., 175 Fifth Ave., New York City,
ditor, Lawrence A. Long, 175 Fifth Ave.,
Y.C.

managers are: Fubisher, Issuarry Fubications, Inc., 175 Fifth Ave., New York City.

N.Y.G.

2. The owner is: (If owned by a corporation, its name and address must be stated and also immediately thereunder the name and addresses of stockholders owning or holding 1 percent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a partnership or other unincorporated firm, its name and addresses and individual owners must be given. If owned by a partnership or other unincorporated firm, its name and address, and the company of the company as trustee or in any other ducing the company as trustee or in any other fuduciary relation, the name of the person or corporation for whom such trustee is acting; also the statements in the two paragraphs show the affant's full knowledge and belief as to the circumstances and conditions under which stockholders and conditions under which stockholders, hold stock and securities in a capacity other than that of a bona for owners.

5. The average number of copies of each insue of the publication soil or distributed, through the mails or otherwise, to paid aubscribers during the 12 months preceding the date shown above was: (

Sophia L. Shafer (My commission expires March 20, 1953.)

#### SOIL CONDITIONERS

(Continued from Page 38)

lem is further complicated by the various ways of stating how much soil or large an area can be treated with a given size package. If the law required registration of the product and a proper ingredient statement, then it would be easier to compare directions for use and evaluate the various formulations. At present, we still do not have adequate laboratory means for comparing the various formulations on the basis of chemical analyses or physical tests but these can be developed. Practical tests with

different soils are indicative of value but such tests do not lend themselves really to quantitative evaluation and are generally not adequate as the basis of administrative action.

In California, we have drawn official samples of many of the polyelectrolyte soil amendment products found in the channels of trade. We have determined total nitrogen, phosphoric acid, potash, moisture, loss on ignition, ash, and the pH when diluted one to one hundred. In addition, on liquid products the specific gravity has been determined. The data are shown in Table 1, "Analyses of Polyelectrolytic Soil Conditioners." Of course these simple tests leave much to be desired. They were made because, at the moment, we do not know what tests would be more significant. However even these simple tests do begin to provide an approximate picture of the materials being marketed. For example, the nitrogen varies from about 0.1% to 5%, which indicates that the chemical composition is considerably different from that of acrylonitrile. Most of the materials contain no more than a trace of phosphoric acid and only a few tenths of a percent of potash. Proximate analysis, showing moisture, ash, and organic matter (by difference), demonstrates that the powdered materials contain about 2% to 8% moisture, 25% to 75% ash, and 20% to 70% organic matter or "loss on ignition." Liquid products contain 77% to 91% water. The acidity of a 1% solution of the various products was determined and it ranged from a very acid pH 3.9 to a very alkaline pH 11.0. The densities of the liquid materials were fairly uniform around 8.8 to 9.6 pounds per gallon. These simple tests serve an additional purpose in making a matter of record something about the composition of a brand name product and how it varies with different samples of the same commercial material. For example if a certain brand name product has 25% ash in one sample and 50% ash in another, it is evident that adequate control has not been maintained over the uniformity of the material.

It seems likely, in view of the

## Your Stake in New Laws

The majority report of the Delaney Committee on Chemicals in Foods definitely recommends that the Food, Drug and Cosmetic Act be amended in such a way that, in effect, it will give the Food and Drug Administrator authority over the interstate marketing of pesticides.

Representative Delaney has indicated that new legislation to this effect will be introduced in the next Congress.

The report failed to give adequate recognition to existing legislation, although minority views, expressed by several members of the Committee, present a completely different conclusion.

We are apprehensive that the proposed legislation will be of a radical nature and contrary to the best interests of growers and those who serve agriculture—scientists, land grant colleges and industry.

The real significance of this proposed legislation has not been fully recognized by the leaders of agriculture and industry. As a public service, we are prepared to furnish material on this subject upon request.



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history of development of the chemical industry, that this is only a beginning in the series of materials that will be useful to improve the structure of soil. It seems to us that these polyelectrolyte soil amendments will find a useful place in our economy and we wonder what the possibilities are that small amounts might be included in ordinary commercial fertilizers or agricultural minerals. If this is done, then the resultant mixture comes under the fertilizer law in California and requires our attention the same as any other mixture.

No doubt many people will be disappointed from the results they secure with their small packages of these materials, partly because the proper use of this new kind of material is not fully known, partly because it may not be stated clearly in the labeling. The extravagant claims made for some products will no doubt lead to some disappointments which will reflect upon agricultural chemicals in general. However, many products have passed through such a readjustment period to become members in good standing, so to speak, in the family of agricultural chemicals.★★

#### INSECT SITUATION

(Continued from Page 65)

#### Truck Crop Insects

ABBAGE caterpillars were rather active during October with reports being received from New Jersey to California. The cabbage looper was damaging to spinach in local areas of New Jersey. This insect was heavier than usual on cabbage and broccoli at Experiment Station Farm, Montgomery County, Maryland and required control measures on crucifers in the eastern area of Virginia. Diamond-back moth larvae and the imported cabbageworm were also active in the eastern sections of Virginia. In South Carolina, looper infestations on cole crops ranged from light to heavy with some plantings of cabbage being severely damaged. The imported cabbageworm was also reported as being modestly abundant on collards in Dorchester County, South Carolina. In east Tennessee,

the southern cabbageworm was infesting commercial turnip green fields. Fairly heavy infestations of the cabbage looper and the imported cabbagewerm were on collards in Gadsden County, Florida and some adjacent areas. Heavy infestations of the looper were also present on fall-planted cabbage in areas around New Orleans, Louisiana and in the Rio Grande Valley of Texas. Repeated applications of insecticides were needed to control cabbage looper infestations on lettuce, cabbage, cauliflower, and broccoli in the Salt River Valley of Arizona. The insect was also building up rapidly and causing considerable damage in the West Covina area of Los Angeles County, California.

Of extreme interest to truck growers are reports of the tomato russet mite being found during the past summer for the first time in New Jersey where it was found in Salem and Gloucester Counties, in Pennsylvania from Juniata County, and in Michigan from Monroe County. This mite was first discovered in this country in Modesto, California, in 1940. Since that time, infestations have been reported from Arizona, Nevada, Utah, Colorado, Oklahoma, Ohio, New York, Massachusetts and Texas.

Aphids were also prominent as vegetable pests during October. Cabbage aphids were among the more important pests on crucifers in the eastern area of Virginia. This aphid was also on broccoli and cauliflower in Tennessee, was causing some injury in Utah, and becoming serious on cauliflower in Los Angeles County, California. Melon aphids were heavily infesting fall cucumbers in Tangipohoa Parish, Louisiana, the green peach aphid was moderately abundant on sugar beets and potatoes in the Midvale, Utah vicinity and the turnip aphid moderately abundant on turnips in the Charleston, South Carolina area.

The corn earworm or tomato fruit worm was damaging to tomato and eggplant fruits in the Winter Haven area of Texas and controls were necessary on tomatoes in the Rio Grande Valley. In South Carolina, this insect was relatively abundant on fall tomatoes and moderately heavy infestations were on string beans in Gadsden and adjacent Florida counties. Late in the month, damage continued in eastern Virginia on snap and lima beans where not controlled adequately. In Tennessee, pepper pods in commercial fields of Washington County were attacked heavily.

#### NFA MEETING

(Continued from Page 43)

numerous other social activities will be featured. Events for ladies only will include a boat ride, a bus tour and a fashion show luncheon. In addition, for all those attending the convention, a private travel agency has offered special post-convention tours to Havana, Cuba and Nassau.

The NFA board of directors is scheduled to hold its meeting at 2 o'clock Wenesday afternoon, November 19, the Association has announced.

#### S From New Shell Plant

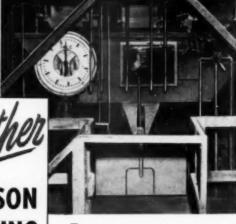
A unit expected to recover up to 55 tons of elemental sulfur daily from waste refinery gases, went into operation October 13 at the Houston plant of the Shell Chemical Corporation.

Construction of the plant was a move aimed at alleviating the critical shortage of sulphur and its most important compound, sulfuric acid, the company stated.

The new sulfur recovery unit, certified by the government as a necessary defense project, was constructed by the Ralph M. Parsons Company of Los Angeles.

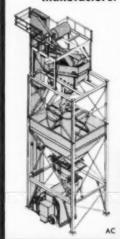
In the recovery process, hydrogen sulfide as contained in waste refinery gases will be catalytically converted to 99½ per cent pure sulfur at an annual rate in excess of 13,000 tons.

An unusual feature of the unit is that the sulfur will be stored in molten form in an underground tank at a temperature of 300 degrees fahernheit. It will remain in this state Johnson multiple material weigh-botcher, with 5,000-lb. dial head scale, accurately weighs up to 5 (or more) fine-grain-ed moterials, Top lavers open fill valves from overhead 5 section bin. Lower lever discharges batch into the mixing unit.



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#### SAFETY MEETING

(Continued from Page 54)

the overall plant inefficiency even further.

Mr. Blair described the various classifications of buildings such as "fire safe construction," and "fire resistant" as compared to "combustible." To rate a "fire safe" classification, areas with combustible contents must be constructed of reinforced concrete or protected steel, with masonry walls, floors and roofs. For occupancies that are not combustible, construction should be of a type that will not burn, such as all steel, corrugated asbestos cement board on steel frame, and equivalent types. Where wood construction must be used, he said, heavy plank on timber or plank on steel should be chosen, with floor and roof framing planned to permit economical installation of automatic sprinklers which he termed as being of utmost importance in fire protection.

"Fire resistant" was defined as construction which will not contribute combustible material to the fire and in addition, will withstand any expected fire without suffering basic damage of structure.

Process and storage areas should be subdivided as much as possible to keep building areas as small as practical so that damage from a single fire may be held to a minimum. This should be done preferably by having separate buildings well spaced from each other with clear space requirements varying, depending upon the type of facing walls, size of building, nature of occupancy and perhaps the type of outside fire protection available. If specifications are lacking, a fifty-foot separation between all major components is regarded as reasonably safe, Mr. Blair said.

Among other suggestions to promote fire safety, the speaker urged the protection of all electrical equipment against corrosion; magnetic protection to prevent "tramp iron" from getting into grinders and causing

dust explosions through sparks; automotive equipment should have special mufflers to guard against passing flames or sparks; plant heating should be by steam or hot water; elevating and conveying equipment should be of non-combustible construction throughout (except for belts themselves); and the availability of proper fire-fighting equipment either within or without the plant. Proper exterior protection may reduce by half, the fire insurance premium that would apply to an unprotected plant and can be a factor in the securing of complete insurance coverage, he said.

#### **Blast Demonstration**

A DEMONSTRATION of how the multiple delayed-action blast works in practice, comprised the program for the morning of October 23. Two busloads of fertilizer men journeyed to the Chicago Heights plant of International Minerals & Chemical Corp. to witness two explosions which reduced the vertical faces of the piles to easily-scooped-up material. The blasts left no overhang at all, and the piles were left reposing at a angle of 45° or less.

In describing the placement of explosives. Mr. Withey showed how six deep holes, 2 inches in diameter, were bored into the pile in two rows; one row about 4 feet from the floor and the other nearer the top of the pile. The top row (3 holes) was bored 11 feet deep with six sticks of explosive in each hole, and the lower three holes were bored 8 feet deep with eight sticks in each. The pile of fertilizer, a 3-9-27 mixture, appeared to rise slightly when the explosion took place, then to fall into a well-broken-up heap. About 65 persons were on hand to witness the blasts.

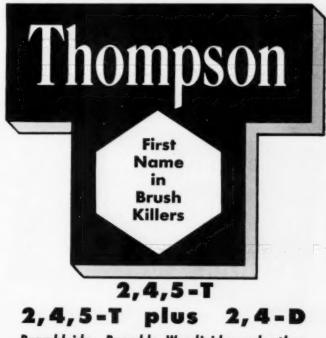
The other explosion, in a pile of fertilizer not stored in a bin, was reduced by the same general method, but with more explosives being used since this could be accomplished with minimum hazard of forcing out walls. A total of 59 cartridges were expploded in the larger demonstration.

Siesmographic records of vibrations of walls in the building indicated that the shock was well within the margin of safety, it was reported at the meeting held that afternoon. Another question and answer period was held, with further queries about methods of safe blasting.

#### **Good Housekeeping**

H OW good housekeeping can inincrease both the efficiency and the safety potential of a plant, was discussed by E. O. Burroughs, Jr., F. S. Royster Guano Co., Norfolk, Va. He declared that a plant's general tidiness is usually an indication of its accident record, since it is almost axiomatic that good housekeeping means a good safety record.

Mr. Burroughs presented sketches of different departments in plants, showing the relationship between a cluttered factory and poor production and bad safety records. Sketches showed stairways covered with dust which become slick under certain conditions; fire extinguishers



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in out-of-reach places where they could never be used in case of a blaze; other fire extinguishers lying on the floor in a corner, empty; hazardous makeshift wiring where vibration wears off insulation; leaving unused pulleys and other parts at top of elevator shaft where vibration causes them to fall on heads of men below; and plants where no fire walls exist.

He said that all workers must be indoctrinated with the safety idea so that it becomes second nature for them to notice improper and unsafe practices in the plant. But, like other speakers, he emphasized that safetymindedness must begin at the top and filter down through the superintendent, the foreman and thence to the men.

A discussion of gas and dust control in fertilizer plants was carried out by Herbert T. Walworth, director of industrial hygiene, Lumbermens Mutual Casualty Co., Chicago. Mr. Walworth presented data on this type of safety from the Tennessee Valley Authority which has had many years of experience in this field.

It is not safe to generalize on controlling hazards in different fields, Mr. Walworth pointed out, but one must know each process and study the safety problems of each. These include phosphate rock mining, the manufacture of triple superphosphate, tricalcium phosphates, ammonium nitrate and mixed fertilizers.

No dust problems arise from wet stages of production, of course, but there are many in the dry state. In operating mills, the incidence of particles sometimes reaches 700 million per cubic foot, but with proper ventilation, this dangerous count may be reduced. Maintenance of mills to avoid sparks and clogging of vents is particularly important, he said.

Dust from car loading or unloading is difficult to control. He reported that it is not unusual to find from 300 million to 400 million particles of dust per cubic foot in such operations, and in such cases, safety to the workers depends upon the use of respirators. Bagging operations are

AGRICULTURAL CHEMICALS

also hazardous from the standpoint of dust unless local exhausts are utilized to carry off the fumes. Valve loaded bags, he noted, lessen the dust problem considerably.

The problem of gases is likewise serious. In making triple superphosphate, there is often exposure to fluorine gas. Where hydrofluorosalicic acid is a factor, exhaust systems are often corroded and damaged, making maintenance a difficult task. At the same time, Mr. Walworth said, these ventilating systems are a key factor. He advised having available at all times, adequate masks and respirators for emergency use.

Tom J. Clarke, GLF Soil Building Service, Ithaca, N. Y., scheduled to give a demonstration on how to conduct a safety meeting, was unable to be present. In his place, John A. Stark, also of GLF, carried out the demonstration by showing pictures on a screen and asking people in the audience what was wrong with the operations thus presented. Errors depicted included the wrong way to lift containers, failing to keep the runways clear, oiling or trying to repair machines while in operation, horseplay, leaving tools in wrong places, having a fire extinguisher covered up with a stack of bags, and walking under a loading shovel.

Correct answers from the crowd brought the reward of a ringing bell and a cigar while wrong replies or failure to see the error caused a buzzer to sound and the bad guesser received a small cigar. It was pointed out that this method of conducting a safety meeting is of interest to the men-in the plant, and they learn to watch for unsafe conditions in their daily work.

In the final paper of the day, Mr. Blair returned to present his talk on "Fire Prevention Through Maintenance." His paper was a sequel to his previous one which covered plant design as a fire preventer. He emphasized the dangers inherent in changing contents of a building from non-combustible to combustible materials when the structure is not built for such occupancy.

Such a change involves certain

modifications such as the installation of automatic aprinklers, or the revision of electrical components to meet code requirements if the new material is dusty or explosive. The addition of magnets in grinder feeders to remove iron is another important matter as is the erection of fire walls to segregate hazardous materials.

Insurance statistics indicate that chemical plants, under which classification fertilizer plants operate, are subject to spontaneous ignition and overheating, electrical misuse, smoking and matches, grinding or mining, defective heating equipment. About 70% of the fires in this classification are the result of these causes.

Despite all this, Mr. Blair summarized by saying that hazards found in fertilizer manufacturing are neither unusually numerous nor insurmountable, yet their study and removal will present a great opportunity for bettering the safety fire record of the industry.

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#### Book Review

Using Commercial Fertilizers. First Edition. By Dr. Malcolm H. McVickar, chief agronomist, National Fertilizer Association, Washington, D. C. Published by The Interstate, Danville, Ill. 1952. Trade price: \$3.

This book tells what commercial fertilizers are, how they are manufactured, and how they should be used on farms for increasing crop production.

The author has done an excellent job of discussing technical processes in every-day terms. He has made no attempt to delve into the theories of chemistry but has stuck to practical, easy-to-read and easy-tounderstand principles of fertilizer manufacture and use. More than 100 photographs and charts are included.

Chapter headings include: Essertial plant growth elements; what plant nutrients do: nitrogen fertilizers: phosphate fertilizers: potash fertilizers; secondary and trace element plant foods; mixed fertilizers; principles involved in the use of fertilizers; how to measure the fertility of soils; methods of applying fertilizers; fertilizer application equipment; the role of commercial fertilizers in soil conservation; fertilizers and plant and animal nutrition; special uses for commercial fertilizers. Also included is a comprehensive glossary of definitions of commonly used fertilizer terms.

This book can be used profitably by vocational agriculture classes and veterans on-the-job training classes. It will also be a valuable addition to book shelves in the offices of county agents, farm advisers, soil conservation workers, and fertilizer salesmen.

#### Cotton Weed Conference

The Beltwide Cotton Chemical Weed Control Conference for 1952 is scheduled to be held at the Hotel Claridge, Memphis, Tenn., on December 4 & 5, according to Claude L. Welch, director of the Division of Production and Marketing, National Cotton Council of America, Memphis, Program details were not available at press time.

#### FERTILIZER GROUP

(Continued from Page 50)

#### Truitt Addresses Group

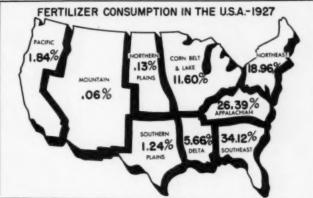
REPRESENTING Amer. Plant Food Council, Paul T. Truitt, president, projected tonnage figures in both production and consumption to indicate that the next few years will see tremendous increases in fertilizer use. He predicted an increase of 51/2% above the 1951-52 record which would put the tonnage used at about 22 million tons. From 10% to 15% more nitrogen is in sight for 1952-53 than was available in 1951-52, Mr. Truitt said. This includes increasing amounts of mixed goods, solid materials, solutions and anhydrous.

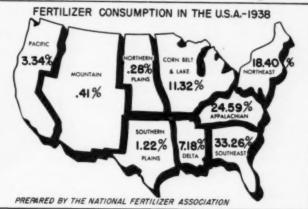
With the nitrogen program moving along satisfactorily, phosphatic fertilizers were the second item in the expansion program, he noted. Although this phase of the program is not complete, the 1955 goal appears likely to be met. DPA certificates of necessity have been issued to expand production of phosphatic fertilizers. The entire nitrophosphate program, at present, calls for production of 118,-000 tons P2O3, he said. In addition, there are five projects to produce ammonium phosphate and altogether, 25 projects have been certified by the Defense Production Administration.

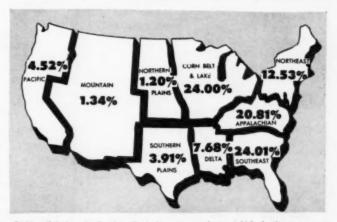
The phosphate program is expected to develop about as follows, Mr. Truitt pointed out: before 2nd quarter, 1952, 151,000 tons; second, third and fourth quarters of 1952, about 185,000 tons. In 1953, about 385,000 tons; and in 1954 about 150,000 tons. This will make a total of about 870,000 tons.

No particular difficulty is expected to arise in expanding the potash output. The goal for domestic production, including imports, has been set at 2 million tons by July 1, 1954. This will be an increase of 600,000 tons over the present annual production of 1,400,000 tons.

Estimated increases for 1952-53 over the 1951-52 quantities were







In his talk before the Fertilizer Control Officials, Dr. Russell Coleman, president, National Fertilizer Association, Washington, presented figures and charts covering the increasing use of fertilizers in the United States from 1927 to 1950. The above charts show nine regions of the U.S. with the percentage each used in rela-

tion to the total U.S. fertilizer consump-

Dr. Coleman emphasized that the figures are percentages and that areas such as the southeast, which in 1927 accounted for 34% of the total and in 1940, only 24%, are actually using more fertilizer than previously.



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summarized by Mr. Truitt as follows: Nitrogen, 10% to 15%; P<sub>2</sub>O<sub>5</sub>, 5% to 10%; K<sub>2</sub>O, 15% to 20%.

A plea for better methods of collection of fertilizer use statistics was made by the APFC head who noted that "these figures are needed in a hurry after the close of the fertilizer year and after the close of the fiscal year. Some states have adequate laws governing the collection of statistics; others do not." He expressed hope that the control officials would lend their support to improving the data which is important in planning production schedules.

The newly-formed fertilizer use charter between the U. S. Department of Agriculture and the Land-Grant Colleges was lauded by Mr. Truitt as a program of action which begins with research and continues through technology, marketing, methods of application, crop response, statistics and economics of fertilizer use and other phases of the complex circumstances which surround the proper use of fertilizers.

The broad educational effort of the program was also pointed out, with Mr. Truitt commenting that the program must be adapted to meet the local need and must be run by local people. "The greatest values will come from doing a better job on more and more individual farms," he concluded.

Although not listed on the advance program, Dr. F. W. Parker, U. S. Department of Agriculture, was invited to speak to the group. He declared that there is and must continue to be an increasing plant food content of fertilizers. Millions of dollars in both private and public funds are involved in the picture, he pointed out, and it is imperative that the plant food concentration be stepped up fast," he added.

He showed tables indicating that future needs call for large tonnages of fertilizers containing 44% plant food, which is double the average of presently-used materials. Since 1920, the plant food content has risen from 16% to 25%, but this is not enough. The farmer's fertilizer bill can be reduced greatly through the increasing of plant food content because of high transporation costs. How the average weight of limestone and other filler can be cut down was indicated in a series of slides.

#### New Fertilizer Era

THAT the fertilizer industry is entering a period of technological change and development "unparalleled in its hundred-year-old history" was brought out by Dr. Ewin C. Kapusta, chemical engineer, of the National Fertilizer Association, Washington, D. C. He divided into three categories the areas of possible research as related to current manufacturing processes: first, those dealing with manufacture of superphosphate; second, those dealing with production of mixed fertilizers; and third, those related to the physical condition of fertilizer mixtures.

The manufacture of normal superphosphate remains an important endeavor of the industry, he pointed out, and the job is not as simple as it may appear because of a wide variation in the nature of both reactants; sulfuric acid and phosphate rock. Rock of one source and grade will result in a superphosphate having physical and chemical properties different from that made by using rock phosphate of a different type even if other conditions are identical. The degree of fineness to which the rock is ground is another factor.

The picture becomes even more complex, said Dr. Kapusta, when one considers the nature of sulfuric acid to be used. Not only is the amount of acid employed for one specific type and quantity of rock important, but its concentration will determine the properties of the finished product, it was pointed out.

Although 70 percent of the fertilizer used by farmers is mixed, still the study of manufacture of ammoniating solutions is of importance, Dr. Kapusta said. The fertilizer industry uses a water solution of anhydrous ammonia and ammonium nitrate, although water solutions of free ammonia and urea are also widely used. Such are employed as a source of nitrogen for three prime reasons, he pointed out. These include the

fact that they provide the most economical method of incorporating nitrogen into mixtures containing normal and triple superphosphate; the free ammonia contained improves the physical condition of the mixtures; and the time for chemical reactions to go to completion is decreased. Limitations in the use of these solutions are largely related to the chemical composition of the goods and their physical condition. The addition of too great a quantity of free ammonia may cause reversion of the available phosphate into a less available form. For a given mixture, the amounts of ammonia which may be added successfully depend upon the conditions of ammoniation and the subsequent processing steps followed. "It is in this direction that more exact data appears to be necessary," he observed.

#### Use of Nitric Acid

NE of the most significant new developments in fertilizer manufacturing technology is the use of nitric acid as a partial or complete replacement for sulfuric acid in the acidulation of rock phosphate, the NFA technician declared. The sulfur shortage was primarily responsible for this shift in the U.S. One of the main deterrents to widespread adoption of nitric acid use is that such plans cannot be carried out in present-day superphosphate plants and furthermore, that nitric acid can be transported neither easily nor cheaply. This would necessitate the operation of a nitric acid plant in connection with the nitrio-phosphate plant.

He said that three processes presently show the most promise of finding early commercial application in the U. S. These include: extraction of rock phosphate with a mixture of nitric acid and sulfuric acids, followed by ammoniation with anhydrous ammonia, addition of potassium chloride and drying. Some of the typical grades produced by this method are 11-11-11, 14-14-0, 7-14-7, and 8-16-0.

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ture of nitric and phosphoric acids, followed by ammoniation, addition of potassium chloride and drying. Some typical products are 14-14-14, 11-22-11, 17-22-0, and 19-19-0.

Process No. 3 entails extraction of rock phosphate with nitric acid alone, followed by ammoniation, addition of potassium or ammonium sulfate and drying. This process was said to be similar to the first process except that the necessary sulfate radical is derived from the ammonium or potassium sulfate rather than sulfuric acid. Typical products from the potassium sulfate modification, he said, are 12-12-12 and 14-12-9.

Dr. Kapusta concluded by saying that crop response tests indicate that these materials are as effective as present-day mixed fertilizers when used on acid soils, but on alkaline soils, limited tests indicate that nitric phosphate fertilizers of low phosphate water solubility, are less effective than the more soluble superphosphate.

Dr. Allen B. Lemmon, chief, Bureau of Chemistry, California State Dept. of Agriculture, discussed some of the problems involved in checking soil conditioners and in classifying various ones under the law. The polyelectrolyte soil conditioners generally do not come under California's laws, he said, although the State's laws classify them as soil amendments, which is the same classification as hay, straw, peat, leafmold and sand when these are applied to the soil. Thus, no registration is required and no specific labeling requirements are set forth in the law. Under these conditions, control officials can only wait until the products are sold and then take action if false claims have been made.

Dr. Lemmon stated that this class of materials should be required by law to be registered before being offered for sale in any state.

That many of the soil conditioners have been analyzed in California, was also pointed out. Their plant food content, moisture, ash, and organic matter content were included. (Results of tests appear elsewhere in this issue.)

#### Herbicide Adv. Group Meets

The industry advisory committee representing herbicide and defoliant chemicals manufacturers met in Washington, October 21. Discussions centered around figures on herbicide exports and the need for more specific data along this line. Committee members told the National Production Authority that the present all-inclusive classification should be broken down into sub-classifications. They suggested that separate totals

should be made available for (1) 2,4-D, 2,4-5-T and TCA; (2) other organic herbicides and, (3) inorganic herbicides.

A representative of the Office of International Trade reported to committee members that exports of chemical herbicides during the first eight months of this year amounted to 8.5 million pounds. He estimated that the 1952 total would reach 10 to 12 million pounds.



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#### Pac. Coast Borax Divisions

Pacific Coast Borax Co., Division of Borax Consolidated. Limited, New York, has announced formation of two new divisions to handle future operations in the agricultural and related fields. Research, development, and sales in the field of crop production and plant nutrients will henceforth operate under the Plant Food Division. E. M. Kitchen and Dr. J. A. Naftel will continue to have charge of the research and sales development programs in this division throughout the United States, with the exception of the eleven western states.

The division operating in the weed control field will now be known as the Agricultural Sales Division. In addition to weed control work, this division will also be responsible for boron deficiency work in the eleven western states. Dr. L. M. Stahler, who has recently joined the company, will have charge of research and development work in this new Agricultural Sales Division.

#### Gallowhur Appoints Geraci

John Geraci has been named plant manager at Ossining, N. Y. for Gallowhur Chemical Co., New York City. Gallowhur manufactures "Puratized" mercurial compounds and "Purasan" quaternary germicides.

#### TECHNICAL BRIEFS

(Continued from Page 60)

fan-type spray pattern have given somewhat better insect control than the cone type and are therefore recommended. These nozzles are available in a wide range of orifice sizes and in several different fan widths. The 80-degree fan width has been used extensively in the experimental spraying and has proved satisfactory. Selection of the correct nozzle orifice size for any spraying operation can be determined from the manufacturers' nozzle specifications.

The sprayer should be adjusted to apply the required amount of insecticide in about 20 gallons of water per acre at 80 pounds per square inch. Both the gallonage and the pressure given are more or less tentative and may be changed as a result of further investigations. The speed at which the sprayer is operated depends on the nature of the field being sprayed. Four miles per hour is satisfactory for most fields.

The Mexican bean beetle, cabbage insects, and pea insects have been controlled satisfactorily with insecticide sprays applied with a low volume sprayer. At present it would seem that a sprayer of this type would find its greatest use in control of these

Summary of "Low Gallonage Spraying of Vegetable Cropp." by G. E. R. Hervey and W. W. Gunkel, New York State Agricultural Experiment Station, Geneva, in Bulletin No. 753, May, 1952.

#### **Entemology In Point Four**

The importance of pesticides in the U. S. Point Four program of technical assistance to foreign countries is the subject of an article in the October issue of Foreign Agriculture, published monthly by the Office of Foreign Agricultural Relations, U.S.D.A., Washington 25, D. C.

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Also noted in this issue is the recent discovery in Bolivia of a new phosphate deposit, one of the few in South America.

#### FUNGICIDES

(Continued from Page 65)

reduced root knot. There was no retardation in growth by the new meal as compared with the old.

The results of these tests show that tung-nut meal is of no value as a soil treatment for the control of root-knot nematodes. The benefit some growers have reported is probably due to the fertilizing effect of the meal. Parathion thoroughly mixed in the soil was of considerable value in rootknot nematode control, as had also been demonstrated in pot culture by other workers, although field treatments have been reported ineffective. It has been suggested that this ineffectiveness is probably due to the less thorough mixing obtained in the field. While parathion is of value in pot culture, its practical field use at this stage is questionable. The effect of parathion upon other plants is unknown, and it should not be used in soil growing food plants, since according to reports, it can be absorbed from the soil and translocated to above-ground parts of the plant. Parathion is toxic to human beings through skin absorption or otherwise and must be used with great care.

#### **Spray Additives Tested**

TARREN N. Stoner, of the Florida Agricultural Experiment Station, reports that the 1949-50 investigations for control of Helminthosporium leaf blight of sweet corn (Helminthosporium turcicum) indicated that some fungicides did give experimental control of the disease. These experiments in 1949-50 were conducted with the fungicidal materials alone. The spray trials of the 1950-51 season included an experiment to determine the effect of the so-called spreader-stickers added to these spray mixtures.

The experiments were conducted on a plot layout of a 4x4 latin square. Each plot consisted of six rows

18 feet long planted on 32-inch centers 8 inches in the drill. Twenty-foot alleyways were used between plots each way. Three materials were used: "p.e.p.s." (polyethylene polysulfide, 1/2 pint per 100 gallons spray), "Triton B1956" (2 ounces per 100 gallons spray), and "Dupont Sticker-Spreader" (sodium sulfates of mixed long chain alcohol-fatty acid esters, 2 ounces per 100 gallons spray) The checks were sprayed with fungicide

only. Zineb in water at the rate of 2 pounds per 100 gallons of finished spray was used as the fungicide on all treatments and the checks. The only difference between treatments was the spray additive used.

The variety planted was Ioana, which is known to be susceptible to Helminthosporium leaf blight. It was grown on mature Everglades peat soil that had been cultivated several years. General fertilizer practices and

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spray applications of manganese and zinc were used to keep the plants in a good state of growth.

Twenty-five percent DDT emulsion in water was used at the rate of 1 quart per 100 gallons of finished spray material for budworm control. Four applications were made as blanket sprays when insect build-up demanded.

All treatments were applied with the Everglades Mule (a high clearance spray machine). A sufficient number of the Tee Jet nozzles to obtain good coverage were used and the sprays were put on at 300 pounds p.s.i. Eight weekly applications were made. Spray operations ceased when the tassels appeared.

Climatic conditions in the spring were very good for corn, but unfavorable for natural development of H. twicicum. One blanket application of spore suspension was made ten days before the tassels emerged. Late spring rains then favored the development of the disease and a uniform infection appeared. By the time the corn had matured the disease had made sufficient inroads to allow an intensity index to be taken.

Methods of evaluation used to determine the efficacy of the treatments were as follows: Intensity index total yield per block in pounds unhusked marketable ears; and filling of ears, rated on a basis of 1 for no fill to 10 for complete fill. The data of these indices are listed in Table 2.

These data indicate that under the conditions of this experiment, and with light disease incidence, none of the spray additive materials used appreciably affected the control obtained. Since infection was late and only light to moderate, further investigations will be necessary to determine the influence of the materials under severe prolonged attacks of the disease.

#### CONTROL OFFICIALS

(Continued from Page 51)

phorus compounds, synthetic pyrethrin-like esters and synergists. For their analysis, he said, it is not sufficient to determine one element and calculate back to the original chemical. Inert contaminants and degradation products containing these elements would interfere and lead to erroneous results.

Methods are also needed for determining the products in combination with other insecticides and fungicides and in spray residues, the B. E. P. Q. assistant chief declared.

That the problem is also one

of importance to the manufacturer, producer or formulator, was pointed out by Dr. Haller. Many of the State regulatory agencies publish analyses of insecticidal compositions purchased in the open market. If the methods used give incorrect results, particularly if they indicate a lower content than claimed on the label, the manufacturer is subject not only to a fine, but future sales of his product may suffer. The B. E. P. Q. several years

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ago initiated collaborative studies between government and industry to alleviate the situation, he reported. These studies have included benzene hexachloride, hexaethyl tetraphosphate and tetraethyl pyrophosphate and since last spring, government and industry workers have collaborated in a study of methods for the gamma isomer content of BHC in formulations. Studies are also under way on allethrin, he reported. In the latter instance, it is necessary to determine not only the purity of allethrin but also to develop methods to permit the determination of allethrin in the presence of pyrethrins.

The subject of coined names for pesticidal chemicals having long and complicated technical names, was discussed by Dr. Haller. He reviewed the progress made thus far, and declared that it is no small task to find a name suitable to the various groups to whom it is submitted. As an example, he told about how the name chlordane was chosen, and how some groups of chemists disagreed with

the spelling of the word. However, Dr. Haller pointed out, since there is no relation between a trivial name and exact chemical nomenclature, such objections seem uncalled for.

#### Systemics Discussed

RECALLING that the subject of "internal medication" or "inner therapeutics" has been studied for more than 150 years, Dr. Haller stated that some systemic chemical compounds have shown promise. Of "outstanding promise," he said, is octamethylpyrophosphoramide. "Systox" was also pointed out as being a systemic.

To be classed as a systemic, a compound must be soluble in water, according to some workers, he said, but on the other hand, parathion, insoluble in water, is also classified as systemic.

At the recently-held Paris Congress on Crop Protection, which Dr. Haller attended, it was suggested that systemics should be divided into three classes: stable, endolithic and endo-metatoxic. Their differences

were described as follows: by stable systemics are meant such chemicals as sodium selenate, which is known to be taken up by plants and translocated but is not metabolized or broken down into an inert product. Endo-lithic systemics are those compounds which are absorbed and translocated in the plant and effect their toxic action in the same manner as when sprayed on plants i.e. they act as unchanged chemicals to the extent of at least 98 percent. Endo-metatoxic systemics are those compounds which are absorbed and translocated in the plant and are wholly or partly transformed to products toxic to insects feeding upon the plant.

Whether these terms will be generally accepted remains to be seen, he said, but it is clear that compounds acting systemically do present problems which need to be solved before they can be recommended widely for use by the public.

M. F. Crass, secretary Manufacturing Chemists Association, discussed some of the problems of label-

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ing before the group. He said that the problem of proper labeling is far from being a static one, particularly of late with many new compounds entering the market. He reviewed the history of labeling hazardous chemicals in the experience of the MCA, declaring that sound principles have been enunciated in the organization's manual.

Uniformity in labeling is much to be desired, he said and the signal words, such as "Warning," "Caution." "Danger" etc. should be standardized.

In the final address of the morning session, Dr. A. J. Lehman, chief Division of Pharmacology, Food and Drug Administration, Washington, made a plea for specific methods of detection of pesticidal residues so that better understanding of terminology may be achieved. Although it is possible to remove certain residues from some fruits and vegetables, no way has yet been found to remove translocated pesticides in fruit.

He displayed on the screen various charts showing the toxic hazards of residues, and declared that knowledge of the acute toxicity of a pesticide is of no value in determining or evaluating residues. The same principle holds true in the case of dermal toxicity.

Powdered pesticides are not necessarily dangerous to handle, he said, but solutions are hazardous. He told of various feeding studies involving such materials as DDT, technical BHC, lindane, methoxychlor and parathion, and stated that it is now possible to state the toxicity of most pesticides.

Committee reports occupied the remainder of the day, with election of officers taking place as the final event of the week.

#### FERTILIZER LOANS

(Continued from Page 34)

sure to look back and be proud of his farm operation. It is this type of figuring . . . of investing borrowed money in fertilizer . . . that is using the loans and the capital we have to the best advantage.

That will take some more

awareness on the part of farmers—and of bankers too. The State College says that about one bank in six is in tune to the better agricultural profit-making ideas. The bulk of the banks now loan for cattle—for machinery—for hog feed. But many of them haven't tuned in on fertilizer loans yet. At that, the amount of fertilizer per farm in our area is not yet to the point that many loans are needed.

That is all the more reason

why it would be well to carry the word to the farmers and the bankers in this midwestern part of the country. There are some real growth possibilities for fertilizer here — more than in the areas where poorer soils forced the use of fertilizer long before we found it would do us some real good.

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be paid from profits rather than a sell-out of capital assets.

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Fertilizer is coming, in our area. Unless conditions change a good deal, we will be using a lot of it within a few years. But farmers and bankers and extension people and fertilizer salesmen all have to work at it. For our part, we like to deal with folks who have a plan and who know where they are going. Those folks are the kind which make good bank customers — and good banks. We are happy and willing to do what we can to help them make that larger profit.\*\*

#### INSECTICIDE TESTS

(Continued from Page 45)

ed plants was extracted and the presence of an insecticide in plant sap demonstrated.

Since there seemed to be no method of sealing off the container of nutrient solution in such a way that no toxic vapors could escape and reach the plant, another procedure was employed. In a jar of nutrient solution containing the toxicant and the growing plants, was placed a small-necked vial containing only nutrient solution. A plant was placed in this vial, and although its roots

were not in contact with the insecticide, its leaves were fully exposed to the vapors rising from the larger container. At the end of the test the plants having their roots in the toxic solution killed insects placed on them. The plant exposed to vapors only was nontoxic. This was true even though the concentration of insecticide was increased to 100 times the minimum concentration required for systemic effect. It was therefore concluded that there was true translocation, as dif-

ferentiated from condensation of toxic vapors from the solutions.★★

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#### NEMATODE CONTROL

(Continued from Page 41)

fertility and other soil troubles. Therefore, when soil fumigation is introduced to a community where it has not been used before, sales campaign must include a large amount of educational activity. An important feature is demonstration plots to show the effect of soil fumigation on crop yields. When these have shown good results for a season or two, some of the more progressive and prosperous growers will make trial applications. These lead to applications on a larger scale and the more conservative growers become interested, but it is often several years before sales reach a profitable volume.

Other than the soil fumigants, chemicals are used for nematode control only in very small amounts. The leaf nematodes of chrysanthemum and other plants can be controlled by repeated spraying with parathion. These nematodes are also controlled by the application of sodium selenate to the soil. The chemical is taken up by the plant and acts as a systemic nematocide. Selenium is highly poisonous to man and animals and should never be used on food crops or even applied to soil which might be used for food crops in the future. Particularly in tobacco seedbeds, urea and cyanamid are used for control of weeds and nematodes. Nitrites, particularly those of sodium and potassium, and sodium azide have also been used for this purpose.

Most of the modern insecticides have been tested as soil nematocides. Nearly all have been found ineffective for this purpose, though fair results have been obtained with parathion and "Systox" when used in amounts far in excess of those necessary to control insects.

An intensive search for new and better nematocides is now being conducted; the principal objectives being to find soil nematocides which are less expensive and less toxic to plants than those now in use, and to find nematocides for special purposes, such as killing the nematodes often found as contaminants of imported plant material. Less expensive soil nematocides would be in a favorable position to compete on the present market and could reach large new markets. Nematocides with less toxicity to plants would have the advantage of reducing or eliminating the interval between fumigation of the soil and planting, or might even be used around the roots of living plants. On the other hand, it would be highly advantageous to have a nematocide with the weed seed killing ability of chloropicrin, chlorobromopropene and methyl bromide, but inexpensive enough for large scale use.

Undoubtedly, the use of chem-

icals for nematode control will increase in the future, but at this point, the prospects seem better for a slow increase rather than spectacular advances. At present prices for soil fumigants and farm produce, the market for soil fumigants is limited to growers of crops of rather high value. Only a fraction of this market has been reached. Increased sales depend on extended educational activities, which of course require considerable time and effort.

Much remains to be learned, but the work of the past twenty years has made it clear that it is possible to control soil pests by the use of chemicals. Furthermore, such control is necessary if the most efficient use is to be made of the soil. Future research and commercial development will make control of soil pests an important contribution to the production of more and more food and fiber needed by the expanding population of the world.

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#### Dr. Paul A. Neal Dies

Dr. Paul A. Neal, \$1, a medical director of the U. S. Public Health Service died October 13 in Washington, D. C. Mr. Neal was an important witness before the Delaney Committee, presenting data on the effect of different insecticides on public health. He had been with the Public Health Service since 1928.

## Advertisers' Index

A	0
Accessories Mfg. Co.  Aluminum Co. of America	Oct.
American Agricultural Chemical Co.	
American Cyanamid Co.  American Polymer Corp.	
American Potash & Chem. Corp	
American Vermiculite Corp	
Andrews, W. R. E. Sales, Inc	
Antara Chemicals, Division of Gene	
Dyestuffs Corp.	Oct.
Arkell & Smiths	Oct.
Armour & Co.	Sep1.
Ashcraft-Wilkinson Co.	
Atlas Powder Co.	Oct.
Attapulgus Clay Co.	4
Baker H. J. & Bro 6.	30, 31
Bagpak Division, International Paper	
Baughman Mfg. Co	
Bemis Bro. Bog Co	
Berkshire Chemicals, Inc.	
Betner, Benj. C. Co.	
California Spray Chem. Co.	Sent
Chase Bog Corp.	
Chemical Construction Corp.	
Coddington Mfg. Co., E. D.	
Cohutta Taic Co.	
Columbia Southern Chemical Corp.	
Combustion Engineering-Superheater	
Inc. Raymond Pulverizer Div.	
Commercial Solvents Corp.	
Cox, Dr. Alvin J.	
Cox, Dr. Aivin J.	124
Davies Nitrate Co., Inc.	
Davison Chemical Corp.	
de Ong, Dr. E. R.	124
Diamond Alkali Co.	22
Dings Magnetic Separator Co	114
	Oct.
du Pont de Nemours & Co., E. I	88
Edco Corp.	Oct.
Ethyl Corp.	
Eston Chemicals, Inc.	
Fischbein Co., Dave	106
Floridin Co.	Sept.
Fry Co., Geo. H.	123
Fulton Bag & Cotton Mills	78
Geigy Co.	32

General Chemical Division, A Chemical & Dye Corp.	llied
Chemical & Dye Corp	
Georgia Talc Co	110
Glendon Pyrophyllite Co	
Greeff & Co., R. W.	118
Hammond Bag & Paper Co	72
Harte, John J.	74
Heckatharn & Co.	116
Highway Equipment Co.	73
Hercules Powder Co	4th Cover
Hough Co., Frank G.	11
Huber, J. M. Corp.	119
Hudson Pulp & Poper Corp	13
Industrial Marking Equipment	Co 114
International Ore & Fertilizer	
Jaite Co	
Johns-Manville Co.	94
Johnson, C. S. Co.	100
Kolker Chemical Works, Inc	
Koppers Co.	Oct.
Kraft Bag Co.	Oct.
Lion Oil Co.	62
Marietta Concrete Corp.	120
McLaughlin Gormley King Co.	113
Mente & Co	
Michigan Chemicals Corp	12
Monorch Manufacturing Works,	Inc 120
Monsonto Chemical Co	10, 58
National Agricultural Chemical Naugatuck Chemical Division,	
Rubber Co.	
Niagara Chem. Div. Food Mac Chem. Carp.	
Ninol Laboratories, Inc.	9
Nitrogen Division, Allied Chen	
Dye Corp	
Nopco Chemical Corp.	
reopto Chemical Corp	104
Oberdorfer Foundries, Inc	
Pacific Coast Borax Co	
Chas. Page Co	

Pennsylvania Industrial Chemical	
Corp.	Sepi
Pennsylvania Salt Manufacturing Co	Sant
Phelps Dodge Refining Corp	
Phillips Chemical Co	14
Pioneer Chemical Associates	103
Pioneer Pyrophyllite Corp	1112
Pittsburgh Agricultural Chemical Co.	
a Division of Pittsburgh Coke and	
Chemical Co.	1.6
Planters Fertilizer & Phosphate Co	195
	3
Private Brands, Inc.	118
Powlsen, A. E. & Co	Oct.
Powell, John & Co2nd (	Cove
Raymond Pulverizer Division, Combus-	
tion Engineering-Superheater, Inc	
Rieke Metal Prod. Corp	
Riedeburg, Theodore Associates	124
Rodgers, George G. Co	
Rohm & Haas Co	1.5
Southeastern Clay Co	120
Southwest Potash Corp.	Sant
Spencer Chemical Co	
Spraying Systems Co	122
Stauffer Chemical Co	63
Sprout, Waldron & Co	Oct.
Sturtevent Mill Co	90
Synthetic Nitrogen Products Corp. 3rd (	over
Tennesssee Corp.	109
Tennessee Corp.	109 Oct
Tennessee Corp. Tennessee Products & Chemical Corp. Texas Gulf Sulphur Co.	Oct.
Tennessee Corp. Tennessee Products & Chemical Corp. Texas Gulf Sulphur Co. Thompson Chemicals Corp.	109 Oct. Oct.
Tennesssee Carp. Tennesssee Products & Chemical Carp. Texas Gulf Sulphur Co. Thompson Chemicals Carp. Thompson-Hayward Chemical Co.	109 Oct. Oct. 101 82
Tennesssee Carp. Tennesssee Products & Chemical Carp. Texas Gulf Sulphur Co. Thompson Chemicals Carp. Thompson-Hayward Chemical Co.	109 Oct. Oct. 101 82
Tennessee Corp. Tennessee Products & Chemical Corp. Texas Gulf Sulphur Co. Thompson Chemicals Corp. Thompson-Hayward Chemical Co. Titlestad, Nicolay Corp. Tobacco By-Products & Chemical Corp.	109 Oct. Oct. 101 82 Oct. 26
Tennessee Corp. Tennessee Products & Chemical Corp. Texas Gulf Sulphur Co. Thompson Chemicals Corp.	109 Oct. Oct. 101 82 Oct. 26
Tennessee Corp. Tennessee Products & Chemical Corp. Texas Gulf Sulphur Co. Thampson Chemicals Corp. Thompson-Hayward Chemical Co. Titlestad, Nicolay Corp. Tobacco By-Products & Chemical Corp. Townsend, Dr. G. R.	109 Oct. 0ct. 101 82 Oct. 26
Tennessee Corp. Tennessee Products & Chemical Corp. Texas Gulf Sulphur Co. Thampson Chemicals Corp. Thompson-Hayward Chemical Co. Titlestad, Nicolay Corp. Tobacco By-Products & Chemical Corp. Townsend, Dr. G. R.	109 Oct. 0ct. 101 82 Oct. 26
Tennessee Corp. Tennessee Products & Chemical Corp. Texas Gulf Sulphur Co. Thompson Chemicals Corp. Thompson-Hayward Chemical Co. Tirlestad, Nicolay Corp. Tobacco By-Products & Chemical Corp. Townsend, Dr. G. R. Union Bag & Paper Corp.	109 Oct. Oct. 101 82 Oct. 26 124
Tennesssee Carp.  Tennesssee Products & Chemical Carp.  Texas Gulf Sulphur Ca.  Thompson Chemicals Carp.  Thompson-Hayward Chemical Ca.  Titlestad, Nicolay Carp.  Tobacco By-Products & Chemical Carp.  Townsend, Dr. G. R.  Union Sag & Paper Carp.  Union Special Machine Ca.	109 Oct. Oct. 101 82 Oct. 26 124
Tennessee Carp.  Tennessee Products & Chemical Carp.  Texas Gulf Sulphur Co.  Thompson Chemicals Carp.  Thompson-Hayward Chemical Co.  Titlestad, Nicolay Carp.  Tobacco By-Products & Chemical Carp.  Townsend, Dr. G. R.  Union Bag & Paper Carp.  Union Special Machine Co.  United Chemical Co.	109 Oct. Oct. 101 82 Oct. 26 124 17 Oct. 116
Tennessee Carp.  Tennessee Products & Chemical Carp.  Texas Gulf Sulphur Co.  Thompson Chemicals Carp.  Thompson-Hayward Chemical Co.  Titlestad, Nicolay Carp.  Tobacco By-Products & Chemical Carp.  Townsend, Dr. G. R.  Union Bag & Paper Carp.  Union Special Machine Co.  United Chemical Co.	109 Oct. Oct. 101 82 Oct. 26 124 17 Oct. 116
Tennessee Carp.  Tennessee Products & Chemical Carp.  Texas Gulf Sulphur Co.  Thompson Chemicals Carp.  Thompson-Hayward Chemical Co.  Titlestad, Nicolay Carp.  Tobacco By-Products & Chemical Carp.  Townsend, Dr. G. R.  Union Bag & Paper Carp.  Union Special Machine Co.  United Chemical Co.  U. S. Industrial Chemicals, Inc.  U. S. Potash Co.	109 Oct. Oct. 101 82 Oct. 26 124 17 Oct. 116 25 27
Tennessee Carp. Tennessee Products & Chemical Carp. Texas Gulf Sulphur Co. Thompson Chemicals Carp. Thompson-Hayward Chemical Co. Titlestad, Nicolay Carp. Tobacco By-Products & Chemical Carp. Townsend, Dr. G. R. Union Bag & Paper Carp. Union Special Machine Co. United Chemical Co.	109 Oct. Oct. 101 82 Oct. 26 124 17 Oct. 116 25 27
Tennessee Corp.  Tennessee Products & Chemical Corp.  Texas Gulf Sulphur Co.  Thompson Chemicals Corp.  Thompson-Hayward Chemical Co.  Titlestad, Nicolay Corp.  Tobacco By-Preducts & Chemical Corp.  Townsend, Dr. G. &.  Union Bag & Paper Corp.  Union Special Machine Co.  United Chemical Co.  U. S. Industrial Chemicals, Inc.  U. S. Potash Co.  U, S. Steel Corp.	109 Oct. Oct. 101 82 Oct. 26 124 17 Oct. 116 25 27 75
Tennessee Corp.  Tennessee Products & Chemical Corp.  Texas Gulf Sulphur Co.  Thompson Chemicals Corp.  Thompson-Hayward Chemical Co.  Titlestad, Nicolay Corp.  Tobacco By-Preducts & Chemical Corp.  Townsend, Dr. G. &.  Union Bag & Paper Corp.  Union Special Machine Co.  United Chemical Co.  U. S. Industrial Chemicals, Inc.  U. S. Potash Co.  U, S. Steel Corp.	109 Oct. Oct. 101 82 Oct. 26 124 17 Oct. 116 25 27 75
Tennessee Carp.  Tennessee Products & Chemical Carp.  Texas Gulf Sulphur Co.  Thompson Chemicals Carp.  Thompson-Hayward Chemical Co.  Titlestad, Nicolay Carp.  Tobacco By-Products & Chemical Carp.  Townsend, Dr. G. R.  Union Bag & Paper Carp.  Union Special Machine Co.  United Chemical Co.  U. S. Industrial Chemicals, Inc.  U. S. Potash Co.  U. S. Steel Carp.  Vanderbilt Co., R. T.	109 Oct. Oct. 101 82 Oct. 26 124 17 Oct. 116 25 27 75
Tennessee Carp. Tennessee Products & Chemical Carp. Texas Gulf Sulphur Ce. Thompson Chemicals Carp. Thompson-Hayward Chemical Ce. Titlestad, Nicolay Carp. Tobacco By-Products & Chemical Carp. Townsend, Dr. G. R. Union Bag & Paper Carp. Union Special Machine Co. United Chemical Chemicals, Inc. U. S. Potash Co. U. S. Industrial Chemicals, Inc. U. S. Seel Carp. Vanderbill Co., R. T.	109 Oct. Oct. 101 82 Oct. 26 124 17 Oct. 116 25 27 75
Tennessee Carp.  Tennessee Products & Chemical Carp.  Texas Gulf Sulphur Co.  Thompson Chemicals Carp.  Thompson-Hayward Chemical Co.  Titlestad, Nicolay Carp.  Tobacco By-Products & Chemical Carp.  Townsend, Dr. G. R.  Union Bag & Paper Carp.  Union Special Machine Co.  United Chemical Co.  U. S. Industrial Chemicals, Inc.  U. S. Potash Co.  U. S. Steel Carp.  Vanderbilt Co., R. T.	109 Oct. Oct. 101 82 Oct. 26 124 17 Oct. 116 25 27 75
Tennessee Carp. Tennessee Products & Chemical Carp. Texas Gulf Sulphur Co. Thompson Chemicals Carp. Thompson-Hayward Chemical Co. Titlestad, Nicolay Carp. Tobacco By-Products & Chemical Carp. Townsend, Dr. G. R. Union Special Machine Co. United Chemical Co. U. S. Industrial Chemicals, Inc. U. S. Potash Co. U. S. Steel Carp. Vanderbilt Co., R. T. Velsical Carp. Virginia-Carolina Chemical Carp.	109 Oct. Oct. 101 82 Oct. 26 124 17 Oct. 116 25 27 75
Tennessee Carp. Tennessee Products & Chemical Carp. Texas Gulf Sulphur Ce. Thompson Chemicals Carp. Thompson-Hayward Chemical Co. Titlestad, Nicolay Carp. Tobacco By-Products & Chemical Carp. Townsend, Dr. G. R. Union Bag & Paper Carp. Union Special Machine Ca. United Chemical Co. U. S. Industrial Chemicals, Inc. U. S. Potash Co. U. S. Seel Carp. Vanderbill Co., R. T. Velsical Carp. Virginia-Carolina Chemical Carp. Williams Patent Crusher & Pulverizer Co.	109 Oct. Oct. 101 82 Oct. 26 124 17 Oct. 116 25 27 75 67 20 26
Tennessee Carp. Tennessee Products & Chemical Carp. Texas Gulf Sulphur Co. Thompson Chemicals Carp. Thompson-Hayward Chemical Co. Titlestad, Nicolay Carp. Tobacco By-Preducts & Chemical Carp. Towasend, Dr. G. R. Union Bag & Paper Carp. Union Special Machine Co. United Chemical Co. U. S. Industrial Chemicals, Inc. U. S. Potash Co. U, S. Saleel Carp. Vanderbilt Co., R. T. Velsical Carp. Virginia-Carolina Chemical Carp. Williams Patent Crusher & Pulverizer Co. Williams Patent Crusher & Pulverizer Co.	109 Oct. Oct. 101 82 Oct. 26 124 17 Oct. 116 25 27 75 67 20 26
Tennessee Carp. Tennessee Products & Chemical Carp. Texas Gulf Sulphur Co. Thompson Chemicals Carp. Thompson-Hayward Chemical Co. Titlestad, Nicolay Carp. Tobacco By-Products & Chemical Carp. Tobacco By-Products & Chemical Carp. Townsend, Dr. G. R. Union Bag & Paper Carp. Union Special Machine Co. United Chemical Co. U. S. Industrial Chemicals, Inc. U. S. Potash Co. U. S. Steel Carp. Vanderbill Co., R. T. Velsical Carp. Williams Patent Crusher & Pulverizer Co.	109 Oct. Oct. 101 82 Oct. 26 124 17 Oct. 116 25 27 75 67 20 26
Tennessee Carp. Tennessee Products & Chemical Carp. Texas Gulf Sulphur Ce. Thompson Chemicals Carp. Thompson Hayward Chemical Co. Titlestad, Nicolay Carp. Tobacco By-Products & Chemical Carp. Townsend, Dr. G. R. Union Bag & Paper Carp. Union Special Machine Co. Union Special Machine Co. U. S. Industrial Chemicals, Inc. U. S. Potash Co. U. S. Steel Carp. Vanderbill Co., R. T. Velsical Carp. Virginia-Carolina Chemical Carp. Williams Patent Crusher & Pulverizer Co. Williams Patent Crusher & Pulverizer Co. Williams Alumni Research	109 Oct. Oct. 101 82 Oct. 26 124 17 Oct. 116 25 27 75 67 20 26 118 117
Tennessee Carp. Tennessee Products & Chemical Carp. Texas Gulf Sulphur Co. Thompson Chemicals Carp. Thompson Hayward Chemical Co. Titlestad, Nicolay Carp. Tobacco By-Products & Chemical Carp. Tobacco By-Products & Chemical Carp. Townsend, Dr. G. R. Union Bag & Paper Carp. Union Special Machine Co. United Chemical Co. U. S. Industrial Chemicals, Inc. U. S. Potash Co. U. S. Steel Carp. Vanderbilt Co., R. T. Velsical Carp. Williams Patent Crusher & Pulverizer Co. Williams Patent Crusher & Pulverizer Co. Williams Patent Crusher & Pulverizer Co. Williams Alumni Research Foundation	109 Oct. Oct. 101 82 Oct. 26 124 17 Oct. 116 25 27 75 67 20 26 118 117
Tennessee Carp. Tennessee Products & Chemical Carp. Texas Gulf Sulphur Co. Thompson Chemicals Carp. Thompson Hayward Chemical Co. Titlestad, Nicolay Carp. Tobacco By-Products & Chemical Carp. Townsend, Dr. G. R. Union Bag & Paper Carp. Union Special Machine Co. United Chemical Chemicals, Inc. U. S. Patash Co. U. S. Industrial Chemicals, Inc. U. S. Potash Co. U. S. Sales Carp. Vanderbilt Co., R. T. Velsical Carp. Williams Patent Crusher & Pulveriter Co. Williams Patent Crusher & Pulveriter Co. Williams Alumni Research Foundation	109 Oct. Oct. 101 82 Oct. 26 124 17 Oct. 116 25 27 75 67 20 26 19 118 117
Tennessee Carp. Tennessee Products & Chemical Carp. Texas Gulf Sulphur Co. Thompson Chemicals Carp. Thompson Hayward Chemical Co. Titlestad, Nicolay Carp. Tobacco By-Products & Chemical Carp. Townsend, Dr. G. R. Union Bag & Paper Carp. Union Special Machine Co. United Chemical Chemicals, Inc. U. S. Patash Co. U. S. Industrial Chemicals, Inc. U. S. Potash Co. U. S. Sales Carp. Vanderbilt Co., R. T. Velsical Carp. Williams Patent Crusher & Pulveriter Co. Williams Patent Crusher & Pulveriter Co. Williams Alumni Research Foundation	109 Oct. Oct. 101 82 Oct. 26 124 17 Oct. 116 25 27 75 67 20 26 19 118 117
Tennessee Carp. Tennessee Products & Chemical Carp. Texas Gulf Sulphur Co. Thompson Chemicals Carp. Thompson Hayward Chemical Co. Titlestad, Nicolay Carp. Tobacco By-Products & Chemical Carp. Tobacco By-Products & Chemical Carp. Townsend, Dr. G. R. Union Bag & Paper Carp. Union Special Machine Co. United Chemical Co. U. S. Industrial Chemicals, Inc. U. S. Potash Co. U. S. Steel Carp. Vanderbilt Co., R. T. Velsical Carp. Williams Patent Crusher & Pulverizer Co. Williams Patent Crusher & Pulverizer Co. Williams Patent Crusher & Pulverizer Co. Williams Alumni Research Foundation	109 Oct. Oct. 101 82 Oct. 26 124 17 Oct. 116 25 27 75 67 20 26 19 118 117
Tennessee Carp. Tennessee Products & Chemical Carp. Texas Gulf Sulphur Co. Thompson Chemicals Carp. Thompson Hayward Chemical Co. Titlestad, Nicolay Carp. Tobacco By-Products & Chemical Carp. Townsend, Dr. G. R. Union Bag & Paper Carp. Union Special Machine Co. United Chemical Chemicals, Inc. U. S. Patash Co. U. S. Industrial Chemicals, Inc. U. S. Potash Co. U. S. Sales Carp. Vanderbilt Co., R. T. Velsical Carp. Williams Patent Crusher & Pulveriter Co. Williams Patent Crusher & Pulveriter Co. Williams Alumni Research Foundation	109 Oct. 101 82 26 124 17 Oct. 116 25 27 75 67 20 26 118 117 Oct. 118 117 Oct. 28 86

(The Advertisers' Index has been chacked carefully but no responsibility can be assumed for any omission)

Penick, S. B. & Co.

#### Name Baker as Distributor

H. J. Baker & Bro., New York, has been named exclusive distributor for "Montansalpeter" ammonium sulphate nitrate. Now being received in bulk from Germany, this 26% nitrogen material is being offered in pellet form to the trade in even-weight bags, f.o.b. usual U. S. Atlantic and Gulf ports. This fertilizer is a double salt, containing 26% nitrogen —  $6\frac{1}{2}$  in the nitrate form and  $19\frac{1}{2}$  in the ammonia form. The combination is ideal for top dressing, side dressing and irrigation since it serves the dual role of encouraging early, vigorous growth plus sustained growth to harvest time.

#### Corkill Made PCB Officer

Fred Corkill has been appointed vice-president and eastern general manager of Pacific Coast Borax Co., Division of Borax Consolidated, Ltd., the company has announced. Mr. Corkill has been with Pacific Coast Borax since 1935. He is a graduate of U.S.C. and Loyola U. Law School.

## Tale Ends

THE recent fertilizer safety meet went over with a "bang" in a literal sense, when the industry members witnessed a couple of delayed-action dynamite blasts in a fertilizer plant in Chicago Heights. Two busloads of conventioneers took the long ride to the site, and beheld a rather convincing demonstration of safe blasting.

A sidelight, or sequel, to the

blasts (there were two of them) was the enormous amounts of dust generated by the charges. Witnesses went back to the city with not only a broader knowledge of how to use dynamite properly, but also with a generous amount of 3-9-27 fertilizer on their shoes, clothes, and hats.

Unusual interest was displayed in solving the problem of how to blast safely, as evidenced by the number of men who arose to catch the early morning bus to the suburbs. Discussion was also lively in the meeting following the demonstrations. (See story on page \$2, this issue)

Harold Noble of S. B. Penick & Co., New York, was to leave in mid-November on a four weeks trip to Cuba, Puerto Rico and Dominican Republic, accompanied by Mrs. Noble. While the trip will be essentially a vacation tour. Mr. Noble did expect to spend some time in each country conferring with sugar producers. The sugar industry is reported to be making increasing use of warfarin rodenticides.

The "battle of the bugs" in Korea is being fought and won by allied forces, reports say. DDT-resistant body lice are being controlled by lindane which is supplied on an individual basis for personal use. In addition, emulsion concentrates are issued in quantity to special teams who carry out large-scale dusting operations for other insect control.

That farming under the sea may be operated profitably, has been stated by Dr. Clyde Williams, director, Battelle Memorial Institute, Columbus, Ohio, who points out that both marine life and fish production may be increased through the application of fertilizers.

For example, he says flounders transplanted into a fertilized, protected arm of the sea have grown about four times as fast in length and 16 times in weight as those not transplanted. These assertions are said to be backed by experiments made by the Scottish Institute for Seaweed Research.

A report on the first year of commercial production of allethrin shows that from 50 to 60 thousand pounds of the material were marketed, according to the U. S. Department of Agriculture. Allethrin, coined name for the pyrethrin-like esters of Cinerin I, has found wide use in the public health field.

## Penetration!



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